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CERTIFICATION REPORT FOR AREA 2, PHASE I ACTIVE FLYASH PILE FOOTPRINT AND ADJACENT AREA EAST OF THE SOUTH CONSTRUCTION ROAD

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

JANUARY 2001

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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REVISION A
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LIST OF ACRONYMS AND ABBREVIATIONS

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A2PI	Area 2, Phase I
AFP	Active Flyash Pile
ASCOC	area-specific constituent of concern
ASL	analytical support level
BTV	benchmark toxicity value
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	constituent of concern
CRDL	contract required detection limit
CU	certification unit
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FEMP	Fernald Environmental Management Project
FRL	final remediation level
HAMDC	highest allowable minimum detectable concentration
HPGe	high-purity germanium (detector)
ICP-AES	inductively coupled plasma atomic emission spectroscopy
IFP	Inactive Flyash Pile
LCS	laboratory control sample
MDC	minimum detectable concentration
mg/kg	milligrams per kilogram
MTL	Material Tracking Log
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU	Operable Unit
pCi/g	picoCuries per gram
PSP	Project Specific Plan
QA/QC	Quality Assurance/Quality Control
RAWP	Remedial Action Work Plan
ROD	Record of Decision
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SDFP	Soil and Disposal Facility Project
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SF	South Field
SSOD	Storm Sewer Outfall Ditch
SWUs	Southern Waste Units
TPU	total propagated uncertainty
V&V	verification and validation
V/FCN	Variance/Field Change Notice
WAC	waste acceptance criteria

EXECUTIVE SUMMARY

This certification report presents the information and data used by the U.S. Department of Energy (DOE) to determine that existing and/or residual soil contamination does not exceed final remediation levels (FRLs) in the footprint of the Area 2, Phase I (A2PI) former Active Flyash Pile (AFP) and the adjacent area east of the south construction access road at the Fernald Environmental Management Project (FEMP). On the basis of this reported information and supporting project files, DOE has determined that no further remedial action is required in this area; therefore, this area can be considered "certified."

Delineation and design of the six certification units (CUs) was initially presented in the Certification Design Letter (CDL) for A2PI AFP Footprint and Adjacent Area East of the South Construction Road (DOE 2000a). Certification sampling was conducted in all CUs to verify that the certification criteria established in the Sitewide Excavation Plan (SEP, DOE 1998a) were achieved. These criteria state that: 1) the mean concentrations or activities of the primary area-specific constituents of concern within a CU are less than the FRLs at the 95 percent upper confidence level, and 2) no certification result can exceed two times the FRL (i.e., the hot spot criterion). If either of these criteria is not met, further investigation and possible excavation would be required. If both of these criteria are met for a CU, it can be released for final land use development.

The samples were analyzed at the FEMP on-site laboratories and at a FEMP-approved off-site laboratory, following guidelines outlined in the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ, Procedure FD-1000) and the SEP. All these samples were analyzed and reported at the required analytical support level. Analytical data packages included sample results with associated quality assurance/quality control data and all applicable raw data. The data were also subjected to the required validation and verification process, which did not identify any significant quality concerns.

All six CUs achieved the certification criteria. The determination of passing or failing certification was based on a review of certification sample analytical results from each CU against the certification criteria. Statistical analysis was necessary on CUs A2P1-AFP-C-1, 2 and 3 to determine if an area-specific constituent of concern passed certification, due to some above-FRL data. All CUs passed final certification relative to the average constituent of concern concentration and the "hot spot"

determination on the first round of certification. The A2P1-AFP-C-2 CU had one radium-226 sample result which was greater than two times the FRL (Condition 3 in Figure 3-11 of the SEP). Hot spot evaluation with high-purity germanium (HPGe) detectors indicated radium-226 concentrations less than the hot spot criteria and as a result, no additional corrective actions were necessary.

DOE has restricted access to certified areas (and those currently being certified) in order to maintain their integrity prior to development of the final land use. Upon approval from the regulatory agencies, this area will become available for future land use or restoration projects.

1.0 INTRODUCTION

1.1 PURPOSE

This certification report presents the information and data used by the U.S. Department of Energy (DOE) to determine that existing soil contamination does not exceed the final remediation levels (FRLs) within the Area 2, Phase I (A2PI) Active Flyash Pile (AFP) footprint and adjacent area east of the south construction road (Figure 1-1). The soil is being certified in order to proceed with future land use. Based on the data generated and summarized in this report, DOE considers the remedial goals achieved in this area.

1.2 BACKGROUND

In the Operable Unit (OU) 5 Record of Decision (ROD, DOE 1996a), DOE committed to excavating contaminated soil that exceeds health-based FRLs. The excavated material may be dispositioned at the On-Site Disposal Facility (OSDF) or at an off-site disposal facility if the OSDF waste acceptance criteria (WAC) are not met. The OU5 Remedial Investigation Report (DOE 1995) defined the extent of soil contamination exceeding the FRLs and, in general, indicated widespread contamination occurring in approximately 430 acres of the 1,050-acre Fernald Environmental Management Project (FEMP).

In the OU5 Remedial Action Work Plan (RAWP, DOE 1996b), DOE committed to preparing a Sitewide Excavation Plan (SEP, DOE 1998a) to define the overall approach to cleaning up soil and at- and below-grade debris in accordance with the OU2, OU3, and OU5 RODs. Per the SEP, the FEMP has been divided into distinct remedial areas and phases for soil remediation; this report addresses a portion of the soils in A2PI.

1.3 AREA DESCRIPTION

A2PI consists of the Southern Waste Units (SWUs), which are the Inactive Flyash Pile (IFP), South Field (SF), AFP and the adjacent non-waste unit area as shown in Figure 1-1. A2PI certification will be performed in phases with the first phase consisting of the AFP area. The scope of this Certification Report is limited to the first phase, the AFP area. The additional phases of certification will encompass the remainder of A2PI, including the footprints of the SF and IFP.

The A2PI AFP certification area is bounded to the north by an east-west swale (fed by Culvert 1) and SWU construction support area, to the east and south by the Storm Sewer Outfall Ditch (SSOD), and the west by the south construction access road. The steep-sloped, tree-covered hillsides east of the AFP drain into the SSOD.

The A2PI AFP certification area is approximately 6 acres. Within the certification area, there were several remediated footprints: the AFP, two north-south ditches (Ditch 9 and 10), and one retention basin (Basin 3). These remediated footprints cover approximately 4 acres of the certification area.

1.4 SCOPE

This report presents the results from the certification of the A2PI AFP footprint and adjacent area east of the south construction road and the subsequent conclusions. This area is divided into six certification units (CUs). The certification design for the CUs follows the general approach outlined in Section 3.4 of the SEP and is detailed in the Certification Design Letter (CDL) for the A2PI AFP Footprint and Adjacent Area East of the South Construction Road (DOE 2000a).

1.5 OBJECTIVES

The objectives of this Certification Report are:

- Describe the precertification and remedial activities
- Describe the analytical methods, data validation processes, data reduction and statistical processes used to support the certification process
- Present certification sampling results for the six CUs
- Present the statistical analysis showing that all six CUs have passed the certification criteria, including FRL attainment and hot spot criteria
- Describe access controls implemented to prevent recontamination.

1.6 REPORT FORMAT

This certification report is presented in six sections with supporting documentation and data in the appendices. These sections are as follows:

Section 1.0	Introduction: Purpose, background, area description, scope, and objectives of the report
Section 2.0	Certification Approach: The approach for certification sampling and analysis
Section 3.0	Overview of Field Activities: Historical data evaluation, precertification, area preparation, excavation and changes to work scope
Section 4.0	Analytical Methodologies, Data Validation Processes and Data Reduction
Section 5.0	Certification Evaluation and Conclusions
Section 6.0	Protection of Certified Areas
Appendix A	Certification Statistics
Appendix B	Approval of Variance/Field Change Notices (V/FCNs) to the Certification Sampling Project Specific Plan (PSP)
Appendix C	Certification Results

1.7 FEMP CERTIFICATION MASTER MAP

In order to track certification and characterization for reuse areas at the FEMP, DOE updates a controlled map showing the status of the soil remediation areas and phased areas with all Certification Reports. This map has been updated to add certification of these portions of A2PI (Figure 1-2).

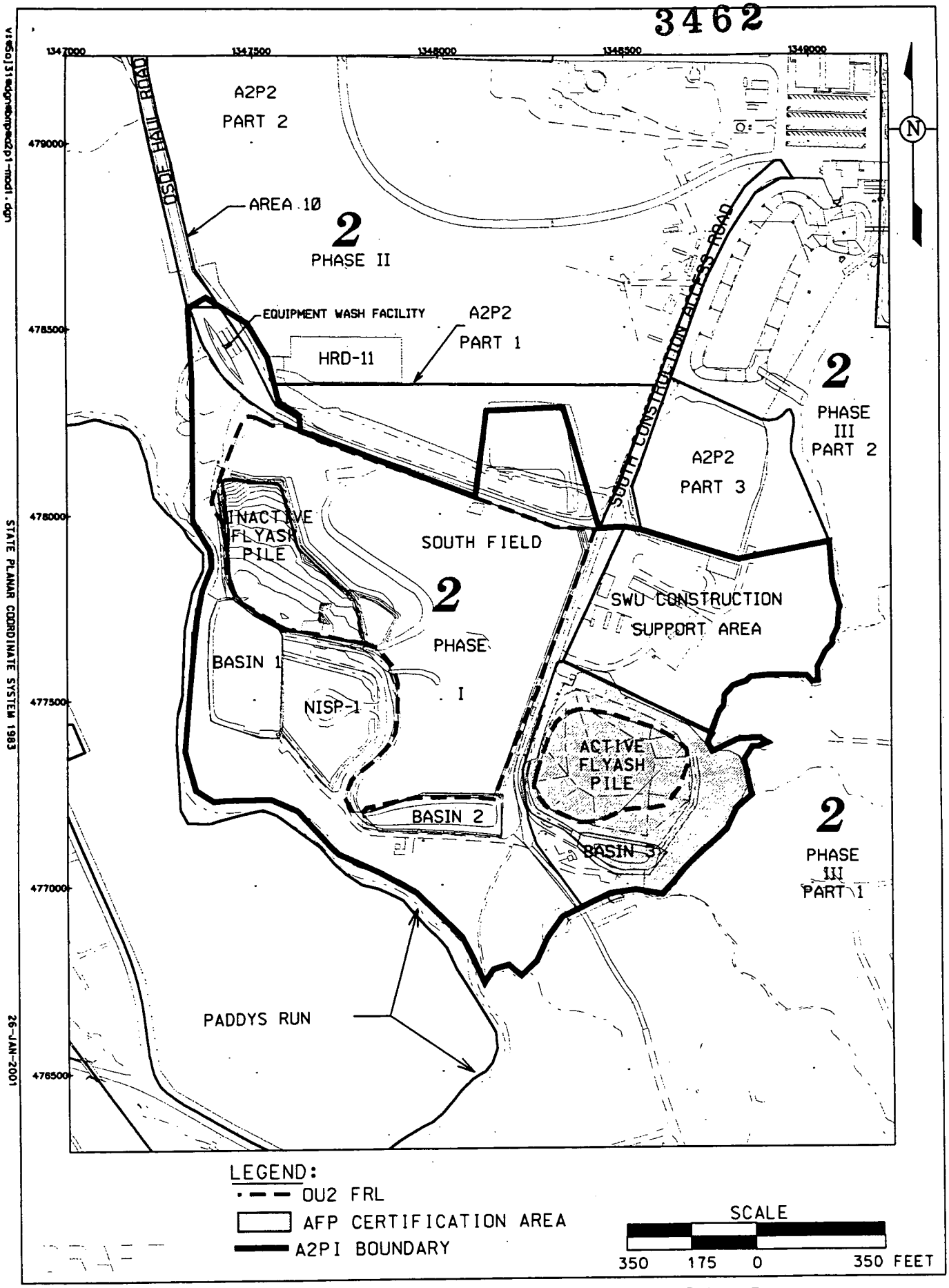
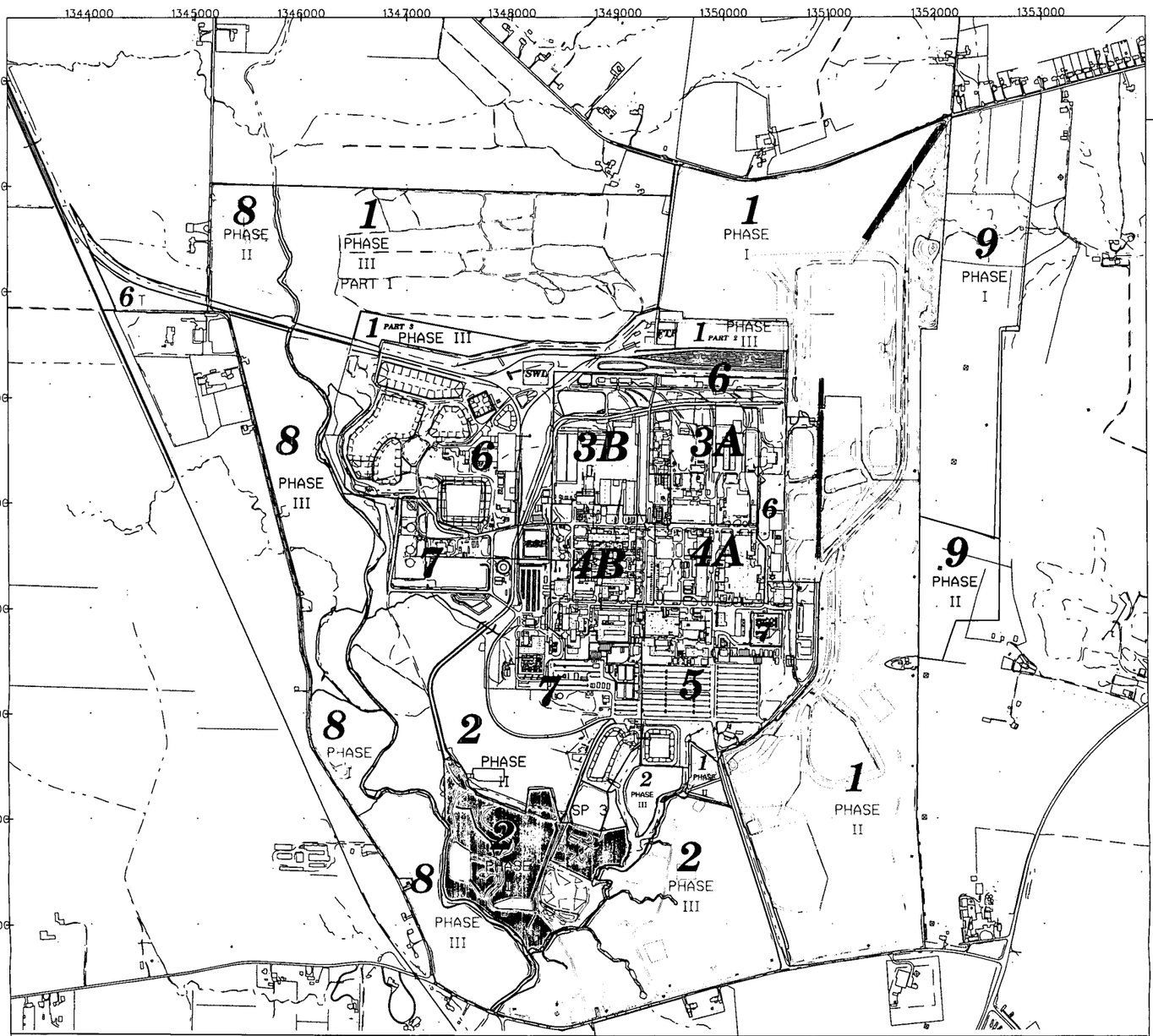


FIGURE 1-1. A2PI MODIFIED BOUNDARY MAP
(EXCLUDES CONSTRUCTION SUPPORT AREA AND UTILITY CORRIDOR)



LEGEND:

APPROVED CERTIFICATION AREAS (421.4 ACRES TOTAL)
- A1PI APROVED CERTIFIED AREAS - 120.5 ACRES
- A1PI SEDIMENT TRAPS 2 AND 3 APPROVED CERTIFIED AREAS 1.4 ACRES
- A1PII APPROVED CERTIFIED AREAS - 136 ACRES
- A1PII-S2B APPROVED CERTIFIED AREAS 1.5 ACRES
- A1PII APPROVED CERTIFIED AREAS WEST OF OLD NORTH ACCESS ROAD - 11.9 ACRES
- A1PIII PART 2 CERTIFIED AREAS - 6.9 ACRES
- A8PI APPROVED CERTIFIED AREAS - 12.5 ACRES
- A8PII/A6TA APPROVED CERTIFIED AREA - 28.2 ACRES
- A8PIII SOUTH APPROVED CERTIFIED - 28.2 ACRES
- A2PIII APPROVED CERTIFIED AREA - 75 ACRES

- A1PI ROADS EXCLUDED FROM CERTIFICATION

CERTIFICATION IN PROGRESS

REMEDIATION IN PROGRESS

CHARACTERIZATION FOR REUSE AREAS - 2.5 ACRES

NON CERTIFIED AREAS

NOTE: UTILITY CORRIDORS WITHIN THE AFP CERTIFICATION AREA WILL BE CERTIFIED AT A LATER DATE.

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SCALE
1200 600 0 1200 FEET

FIGURE 1-2. FEMP CONTROLLED CERTIFICATION MAP

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2.0 CERTIFICATION APPROACH

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2.1 CERTIFICATION STRATEGY

This section summarizes the area-specific constituent of concern (ASCOC) selection process and the certification approach, including CU establishment, sampling design, and statistical analysis. The general certification strategy is described in Section 3.4 of the SEP, and the A2PI AFP specific strategy is described in the CDL for the A2PI AFP Footprint and Adjacent Area East of the South Construction Road.

2.1.1 Selection of ASCOCs

As committed in the SEP, the primary radiological constituents of concern (COCs) (total uranium, radium-226, radium-228, thorium-228, and thorium-232) were retained sitewide as ASCOCs in each remediation area. The selection process for retaining secondary ASCOCs for a remediation area is driven by applying a set of decision criteria, as follows:

- The ASCOC must be listed as a soil COC in the OU5 ROD
- The ASCOC must be traced to site use, either through process knowledge or known release of the constituent to the environment
- Analytical results must indicate the COC is present at concentrations above its FRL sufficient to possibly fail certification criteria, and the above-FRL results are not attributable to false positives or elevated contract-required detection limits (CRDLs).

2.1.2 ASCOC Selection Process for the A2PI AFP Footprint and Adjacent Area East of the South Construction Road

Total uranium, radium-226, radium-228, thorium-228 and thorium-232 are sitewide primary COCs and were retained as ASCOCs.

The reasoning for not retaining certain secondary COCs as ASCOCs was based on the historical data from the area, predesign samples, precertification scanning and the physical characteristics of the COCs (i.e., volatility, degradation, mobility, etc.). The complete ASCOC list can be found in Table 2-1.

2.2 CERTIFICATION DESIGN

The AFP certification area consists of the following and is depicted in Figure 2-1:

- Two Group 1 CUs with the OU2 total uranium FRL: two for the footprint of the former AFP (A2P1-AFP-C-5 and -6)
- Four Group 1 CUs with the OU5 total uranium FRL:
  - Footprint soils of site preparation Ditches 9 and 10 and Basin 3 (A2P1-AFP-C-3)
  - Adjacent perimeter soils which extend to the upper bank of the SSOD (A2P1-AFP-C-1, -2, and -4).

The CUs bounded by the SSOD and the unnamed tributaries extend only partially down the side banks to allow for potential backup during extreme rain events and flooding. The SSOD streambeds and lower side banks are excluded from this certification event and will be certified at a later date with Area 10.

2.2.1 Sample Selection Process

Certification sampling locations was selected according to Section 3.4.2 of the SEP. Each CU was first divided into 16 approximately equal sub-CUs. Sample locations were then generated by randomly selecting easting and northing coordinates within each sub-CU boundary, and testing the locations against the minimum distance criterion for the CU. The minimum distance criterion is the smallest distance allowed between two sample locations within a CU, and is a function of CU size. The formula for calculating the minimum distance is presented in the SEP. If the minimum distance criterion was violated, an alternative random location was selected for that sub-CU, and all the locations were re-tested for minimum distance. The initial CU boundaries are shown in Figure 2-1, and the selected certification sampling locations are shown in Figure 2-2.

2.2.2 Certification Sampling and Analysis

Four of the 16 locations (one per each quadrant of the CU) were randomly selected for archiving, and the other 12 locations were submitted for analysis. All samples were collected from the 0 to 6-inch (surface) soil interval at the designated and surveyed location.

2.2.3 Statistical Analysis

The statistical analysis of certification samples is discussed in Appendix G of the SEP and Section 4 of the CDL. The statistical analyses for all CUs are presented in Appendix A of this report.

TABLE 2-1
ASCOC LIST FOR ALL CUs

ASCOC	FRL/BTV	Reason Retained
Total Uranium	82 mg/kg (10 mg/kg for CU A2P1-AFP-05 and 06)	Retained as a primary ASCOC sitewide
Radium-226	1.7 pCi/g	Retained as a primary ASCOC sitewide
Radium-228	1.8 pCi/g	Retained as a primary ASCOC sitewide
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC sitewide
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC sitewide
Neptunium-237	3.2 pCi/g	Retained as a secondary ASCOC
Arsenic	12 mg/kg	Retained as a secondary ASCOC
Beryllium	1.5 mg/kg	Retained as a secondary ASCOC
Antimony	10 mg/kg*	Retained an ecological COC
Cadmium	5 mg/kg*	Retained an ecological COC
Molybdenum	10 mg/kg*	Retained an ecological COC
Silver	10 mg/kg*	Retained an ecological COC

mg/kg – milligrams per kilogram
pCi/g – picoCuries per gram

* Benchmark toxicity values (BTVs)

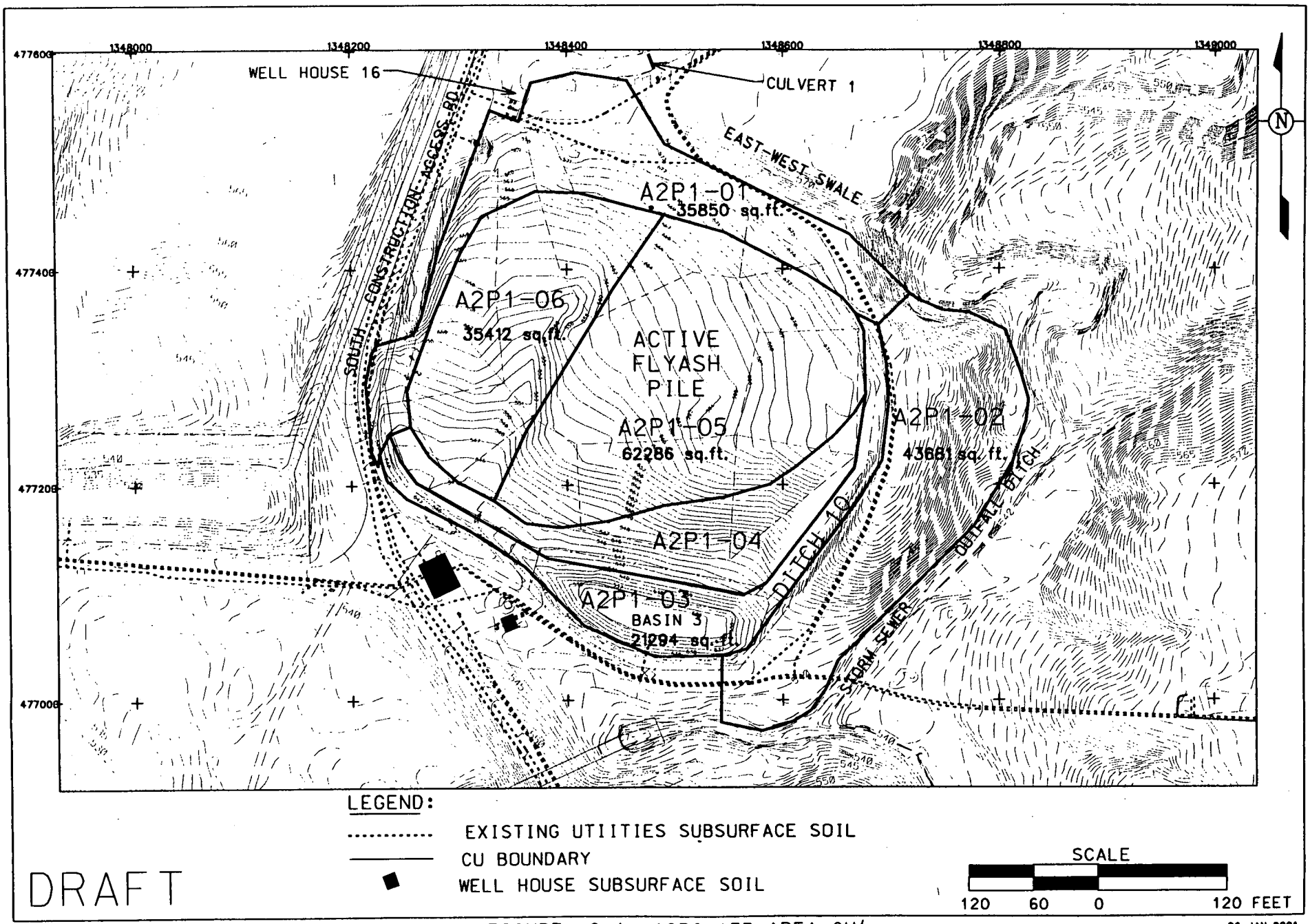

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FIGURE 2-1. A2PI AFP AREA CU's

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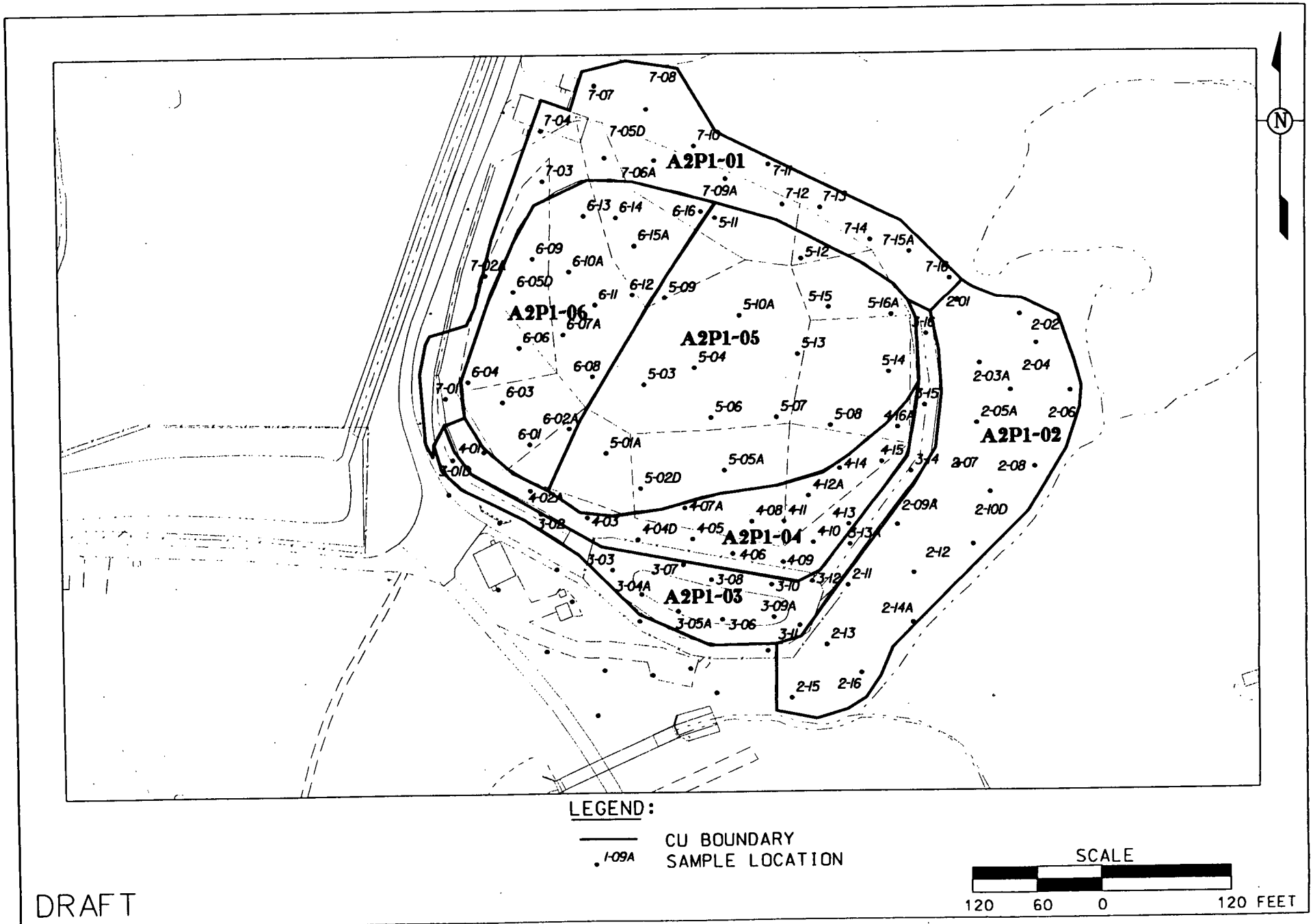

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FIGURE 2-2. A2PI AFP AREA CU SAMPLE LOCATIONS

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3.0 OVERVIEW OF FIELD ACTIVITIES

3.1 DATA EVALUATION, PRECERTIFICATION AND AREA PREPARATION

As discussed in the A2PI SWUs Implementation Plan for OU2 (DOE 1998b) and the CDL, historical data and information were evaluated to determine the remedial design of the AFP. Additional sampling and real-time data were collected during and prior to site preparation and also during remediation in the perimeter areas around the AFP. Listed below is a chronology of events within the AFP certification area over the past 3 years.

- In late Summer 1997, physical soil sampling and real-time scanning commenced to support the site preparation construction activities for the SWUs (AFP specific - Basin 3, Ditch 9, Ditch 10 and the transfer line soils).

- In Fall 1997, Kelchner Environmental began the site preparation construction activities in the SWUs under the direction of Fluor Fernald construction team.

- In Summer 1998, Petro Environmental began remediation activities in the IFP under the direction of the Fluor Fernald construction team. AFP-specific remediation began in late Fall 2000. Per agreement with the regulatory agencies, the AFP flyash was remediated without lift-by-lift real-time scanning. Approximately 40,000 cubic yards of material was excavated from the AFP in 1998 and hauled as Category 1 material to the OSDF for disposal. The Waste Acceptance Organization Material Tracking Log (MTL) number for the material is MTL-SWU-011.

- AFP remediation continued throughout 1999 with 35,500 cubic yards of Category 1 material excavated and hauled to the OSDF under MTL-SWU-011. Most of the flyash material was removed by the end of the 1999 season.

- In late Fall 1999. predesign real-time scanning and physical sampling was initiated to assess FRL attainment and the extent of flyash around the northern, eastern and southern perimeter of the AFP.

- AFP remediation was completed in early October 2000 along with the removal of perimeter flyash, Ditch 9 geotextile liner and riprap, Ditch 10 riprap, and the Basin 3 geotextile liner/riser pipe. The flyash and soil (Category 1) within the footprint of the AFP were hauled to the OSDF under MTL-SWU-011. The flyash, soil, riprap, geotextile liner, and riser pipe from the perimeter ditches and Basin 3 were hauled under MTL-SWU-036.

- Precertification scanning on the excavated AFP footprint was conducted in October 2000, along with submittal of the CDL and certification PSP. The certification units (CUs) are described in Section 2.2. CU A2P1-AFP-C-02 was the only CU without any excavation of impacted material.

- Certification sampling was completed in November 2000.

- Analytical data was received in late December 2000. One sample, A2P1-AFP-C-2-06, had a radium-226 concentration of 5.4 pCi/g. The sample is located east of the AFP, on the edge of a small bank along the SSOD. Since this result is greater than two times the FRL (Condition 3 of Figure 3-11 in the SEP), HPGe hot spot delineation measurements (20 plus one duplicate) were collected at 15-cm detector heights.

  Two of the results were greater than two times the FRL for radium-226 (A2P1-HS-1 and A2P1-HS-2). These two measurements are located immediately adjacent to each other and their combined field of view is 6.3 square meters. Per Section 3.4.6 and Figure 3-11 of the SEP, the hot spot criteria is defined as an area greater than 10 square meters with COC concentrations greater than two times the FRL. Based on the size of the area of contamination and the COC concentration, the above criteria are met and no remediation of the area is required. All the other HPGe measurements were less than two times the FRL for the other COCs (thorium-232 and total uranium). The HPGe results are summarized in Table 3-1 and the measurement locations are mapped in Figure 3-1.

In addition to the Category 1 material, a total of 311 cubic yards of Category 2 and 1,480 cubic yards of Category 4 material has been hauled from the AFP area to the OSDF directly or is stockpiled in the SF awaiting hauling to the OSDF. The total cost for the precertification and certification of the AFP area is approximately $57,000. The total cost of the design and excavation will be summarized in the final A2PI Certification Report.

3.2 CHANGES TO SCOPE OF WORK

The scope of work for A2PI AFP area certification sampling was documented in the A2PI AFP CDL and Certification Sampling PSP (DOE 2000b). Documentation of Ohio Environmental Protection Agency (OEPA) approval for significant V/FCNs to the PSP are provided in Appendix B. The following is a summary of the changes to the scope of work.

- Neptunium-237 was added as a secondary COC for CU A2P1-AFP-05. The COC was added since an above-FRL historical sample point for neptunium-237 is located within the footprint of the CU.

- Modifications to Figure 2-2 and the sample identification table in Appendix B were necessary to correct three samples in CU A2P1-AFP-02.

- Three archive samples from CU A2P1-AFP-03 (the Basin 3 CU) were collected but not submitted for analyses. The samples were collected in anticipation that the basin would continue to accumulate runoff water and not allow sampling without pumping.

TABLE 3-1
AFP HPGe RESULTS

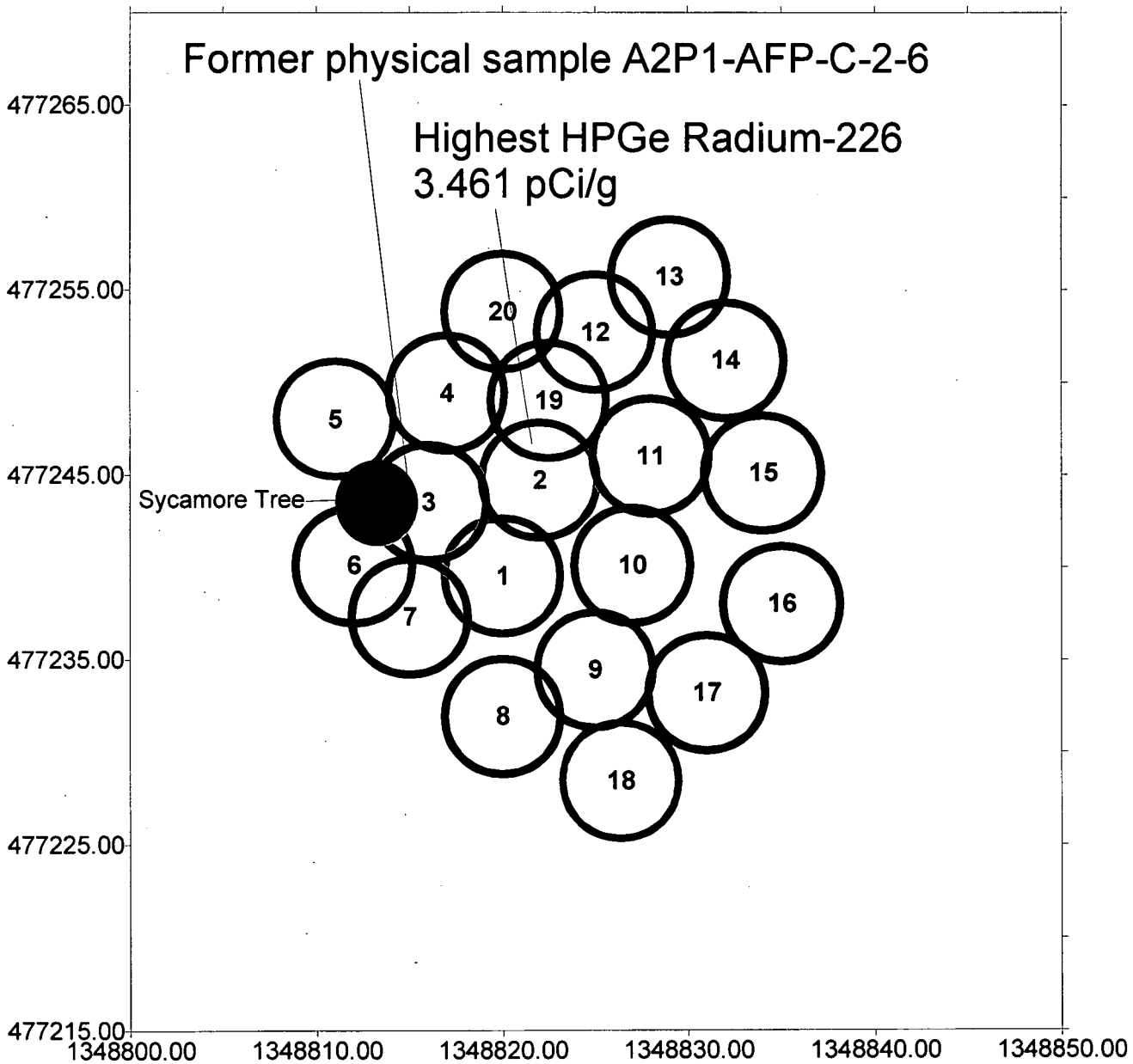
Location ID	Northing	Easting	Radium-226 (pCi/g)	Thorium-232 (pCi/g)	Total Uranium (ppm)
A2P1-HS-1-G	477239.5	1348820.0	3.454	1.49	41.8
A2P1-HS-2-G	477244.7	1348822.0	3.461	1.39	35.4
A2P1-HS-3-G	477243.5	1348816.0	1.34	0.707	23.9
A2P1-HS-4-G	477249.4	1348817.0	1.95	0.924	31.8
A2P1-HS-5-G	477248.0	1348811.0	0.796	0.536	12.9
A2P1-HS-6-G	477240.1	1348812.0	0.891	0.628	23.4
A2P1-HS-7-G	477237.3	1348815.0	1.248	0.834	18.8
A2P1-HS-8-G	477231.9	1348820.0	1.044	0.808	16.9
A2P1-HS-9-G	477234.4	1348825.0	1.729	1.11	27.3
A2P1-HS-10-G	477240.1	1348827.0	1.236	1.51	37.6
A2P1-HS-10-G-D	477240.1	1348827.0	1.212	1.46	36.6
A2P1-HS-11-G	477246.0	1348828.0	1.233	1.41	41.3
A2P1-HS-12-G	477252.7	1348825.0	2.048	1.39	38
A2P1-HS-13-G	477255.7	1348829.0	1.273	1.2	30.6
A2P1-HS-14-G	477251.2	1348832.0	1.063	1.16	23.5
A2P1-HS-15-G	477245.1	1348834.0	1.057	1.01	20.5
A2P1-HS-16-G	477238.0	1348835.0	0.935	0.942	20.2
A2P1-HS-17-G	477233.2	1348831.0	0.905	0.743	12.2
A2P1-HS-18-G	477228.4	1348826.4	0.831	0.713	10.1
A2P1-HS-19-G	477249.0	1348822.5	1.968	1.35	30.3
A2P1-HS-20-G	477253.8	1348820.0	2.417	1.3	35

Figure 3-1

A2P1-AFP-C-2-6 Radium-226 HPGe Map

Moisture & Radon Corrected Radium-226
HPGe Det #: 30687, 31204
Measurement Dates: 01/08/01 - 01/18/01
Field of View to Scale

N



HPGe Radium-226 (pCi/g)
- 0.00 to 0.85
- 0.85 to 1.70
- 1.70 to 3.40
- 3.40 to 5.10
- 5.10 to 10000.00

RTIMP DWG Title: A2P1-NWU-HPGE-RA-MC.srf
Project #: 20400-PSP-0003
Project Name: A2P1 PreCert Real Time Scan
Prepared By: Brian McDaniel
File Name: A2P1-NWU-HPGE-RA-MC.srf
Date Prepared: 01/22/01

4.0 ANALYTICAL METHODOLOGIES, DATA VALIDATION PROCESSES AND DATA REDUCTION

4.1 ANALYTICAL METHODOLOGIES

The samples for A2PI AFP area were analyzed at the FEMP on-site laboratory, which meets Sitewide CERCLA Quality Assurance Project Plan (SCQ, Procedure FD-1000) requirements. The SCQ is the source for analytical methodologies (Appendix G), data validation and verification, and analytical and field quality assurance/quality control (QA/QC) requirements.

For all the certification data, laboratory analysis met all requirements for Analytical Support Level (ASL) D with ASL E exceptions. For soil samples, the project-specified minimum detectable concentration (MDC) for total uranium, thorium-228 and thorium-232 by gamma spectroscopy is less stringent than the ASL D SCQ highest allowable minimum detectable concentration (HAMDC). Therefore, the total uranium, thorium-228 and thorium-232 gamma spectroscopy data were considered ASL E although the data deliverable is identical in all other specifications for ASL D per Appendix G of the SCQ. Also, the on-site laboratory prepared an ASL D data package, which included sample results with associated QA/QC data and all applicable raw data. Certification analytical results are provided in Appendix C and a summary of the analytical methods follows.

4.1.1 Radiochemical Methods

The radiochemical analytical methods depended on the specific nuclides of interest. Performance-based specification criteria included HAMDC, percent overall tracer/chemical recovery, percent matrix spike recovery, method blank concentration, percent recovery of laboratory control sample, and percent recovery for duplicate samples for each analyte. The on-site laboratory was required to meet these specifications using the methodologies described below.

Total Uranium

Samples were analyzed for uranium-238 using gamma spectrometry, and the results were used to calculate the total uranium value. The calculation used was as follows:

$$\text{Total uranium (mg/kg)} = (2.998544) \times \text{uranium-238 gamma spectrometry result (pCi/g)}$$

The validation qualifier assigned to the total uranium value was the same as the uranium-238 qualifier.

Radium-226

Samples were analyzed by gamma spectrometry, and radium-226 was quantified by measuring gamma rays emitted by members of its decay chain. This method does not require chemical separation, but the samples must be allowed a 20-day progeny in-growth period before counting. The on-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A2PI AFP certification results.

Radium-228

Following gamma spectrometry analysis, radium-228 was also quantified by measuring gamma rays emitted by members of its decay chain. The on-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A2PI AFP certification results.

Isotopic Thorium

Isotopic thorium (thorium-228 and thorium-232) was also quantified by measuring gamma rays emitted by members of its decay chain by gamma spectrometry. The on-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A2PI AFP certification results.

4.1.2 Chemical Methods

Metals

Samples were analyzed for arsenic and beryllium using inductively coupled plasma atomic emission spectroscopy (ICP-AES).

4.2 DATA VERIFICATION AND VALIDATION

This section discusses the data verification and validation (V&V) process used to examine the quality of field and laboratory results. Data were qualified to indicate the level of data usability, or level of confidence in the reported analytical results. The U.S. Environmental Protection Agency (EPA) National Functional Guidelines for Data Review (Inorganic Data) (EPA 1994), as adapted and approved by EPA Region V, was used for this process.

Specific parameters associated with the data were evaluated during V&V to determine whether or not the data quality objectives were met. Five principal QA parameters (i.e., precision, accuracy, completeness,

comparability, and representativeness) were addressed during V&V. Field sampling and handling, laboratory analysis and reporting, and nonconformances and discrepancies in the data were examined to ensure compliance with appropriate and applicable procedures.

The V&V process evaluated the following parameters:

- Specific field forms for sample collection and handling
- Chain of Custody forms
- Completeness of laboratory data deliverable.

The data validation process examined the analytical data to determine the validation qualifier of the results. General areas examined that apply to all the chemical data include the following:

- Holding Times
- Instrument calibrations
- Calculation of results
- Matrix spike/matrix spike duplicate recoveries
- Laboratory/field duplicate precision
- Field/Laboratory Blank contamination
- Dry weight correction for solid samples
- Correct detection limits reported
- Laboratory control sample (LCS) recoveries and compliance with established limits.

Parameters unique to the evaluation of radiochemical analyses include:

- Calibration data for specific energies
- Background checks
- Relative Error ratios
- Detector efficiencies
- Background count correction.

For this project, all the radiological data were reviewed and validated for all criteria noted above. Per project requirements, a minimum of 10 percent of the certification data were validated to Level D. This validation included the same review process as for Level B, but included a systematic review of the raw data and recalculations. One of the analytical releases was validated to Level D, while all remaining data were validated to Level B.

Following V&V, qualifier codes were applied to specific data points reflecting the level of confidence assigned to the particular datum. These codes included:

-	No qualification; the positive result or detection limit is confident as reported
J	Positive result is estimated or imprecise; data point is usable for decision-making purposes. Positive results less than the contract required reporting limit are also qualified in this manner
R	Positive result or detection limit is considered unreliable; data point should not be used for decision-making purposes
U	Undetected result at the stated limit of detection
UJ	Undetected result; detection limit is considered estimated or imprecise; the data point is usable for decision-making purposes
N	Positive result is tentatively identified - that is, there is some question regarding the actual identification and quantification of the result. Compound reported is best professional judgement of the interpretation of the supporting data, such as mass spectra. Caution must be exercised with the use of this data
NV	Not Validated. The results for this sample were not validated
Z	This result, or detection limit in this analysis is not the best one to use; another analysis (e.g., the dilution or re-analysis) contains a more confident and usable result.

The V&V of this data set did not identify any problems with the data set. All the results were either not qualified or qualified as estimated (J) and/or nondetects (U). No results were qualified as rejected (R).

4.3 DATA REDUCTION

Each sample used to support the A2PI AFP area certification decision was entered in the FEMP Sitewide Environmental Database (SED) with the following information:

Field Information

- Sample Identification Number - A unique number assigned to each discrete sample point
- Coordinate Information - Northing and Easting locations.

Laboratory Information

For each sample result the following information is entered:

- Laboratory Result - The reported analytical value from the laboratory
- Laboratory Qualifier - The qualifier reported from the lab. For radiological parameters non-detect values are assigned a U qualifier
- Total Propagated Uncertainty (TPU) - This value represents the uncertainty associated with the reported result. TPU includes the counting error, as well as uncertainty from other laboratory measurements and data reduction. (Applicable to radiological parameters only.)
- Units - The units in which the Laboratory Result is reported.

Validation Information

- Validation Result - The result based on the validation process. During the validation process, sample results may be adjusted. If the laboratory result is less than the associated MDC , the validation result becomes the MDC value
- Validation TPU - The TPU based on the validation process (applicable to radiological parameters only.)
- Validation Qualifier - The qualifier assigned as a result of the data validation process
- Validation Units - The units in which the Validation Result is reported.

Using the information as summarized above, the following actions were taken for data reduction of each CU data set.

1. All the data for each CU were queried from SED. All the data were used even if the CU had more than the minimum required data points
2. The data from the validation fields were used for statistical calculations
3. Data with a qualifier of R or Z was not used in the statistical calculations
4. The highest of the two duplicate results was used in the statistical calculations
5. One half of the non-detect (U or UJ) values were used in the statistical calculations.

5.0 CERTIFICATION EVALUATION AND CONCLUSIONS

5.1 CERTIFICATION RESULTS, EVALUATION AND CONCLUSION

After remediation of the flyash and other impacted material, all CUs for the A2PI AFP area passed the certification criteria. HPGe confirmation measurements were required to pass the hot spot criteria (sample result greater than two times the FRL) at a sample location along the eastern edge of the certification area. The HPGe measurement data confirmed the attainment of certification for CU A2P1-AFP-C-02. Final certification data are presented in Appendix C along with the ecological BTV data which are all below BTV concentrations. Based on these results, DOE has determined that the remedial objectives in the OU5 ROD have been achieved in the A2PI AFP area, and no further remedial actions are required. The certification of the transfer line and well house subsurface soil will be addressed at a later date. The subject areas will be released for final land use.

5.2 LESSONS LEARNED

A lessons learned program has been implemented to apply knowledge accumulated during successive remedial and certification efforts conducted under the SEP. This certification effort was the first campaign in which a suspect hot spot from a radium-226 physical sample result was assessed with HPGe measurements. Use of the real-time equipment for hot spot evaluations truly expedited the assessment process. If additional soil samples were required to confirm the suspect hot spot, the schedule for certification would have been extended at least another month.

6.0 PROTECTION OF CERTIFIED AREAS

DOE has restricted access to certified areas in order to maintain their integrity prior to transferral for final land use. FEMP Procedure EP-0008 has been developed to implement a process to protect certified areas from becoming recontaminated.

The procedure is summarized as follows:

- At the beginning of certification sampling activities for a remediation area, the perimeter of the "certified" area will be clearly delineated
- Signs will be posted upon the temporary perimeter limiting access to authorized individuals or projects
- To gain access to conduct work in a "certified" area, the person or project desiring access will submit a written request to the compliance section of Soil and Disposal Facility Project (SDFP)
- Any equipment to be used within the "certified" area must have been cleaned in accordance with FEMP certified area access
- Employees/operators should be briefed on the entry and exit requirements for a "certified" area
- Additional restrictions apply to certified areas that have been restored. The SDFP Compliance section will forward access requests for restored areas to SDFP Natural Resources for written approval prior to entry.

After DOE, EPA and OEPA agree that an area is certified, the area will be released for final land use. At that time, best management practices and administrative controls will be used to protect the area from contamination, and other controls will be implemented as needed.

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U.S. Department of Energy, 2000a, "Certification Design Letter for Area 2, Phase I Active Flyash Pile and Adjacent Area East of the South Construction Road," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, OH.

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U.S. Environmental Protection Agency, 1994, "National Functional Guidelines for Data Review," U.S. EPA Office of Solid Waste and Emergency Response, Washington, DC.

APPENDIX A

CERTIFICATION STATISTICS

Appendix A: Certification Statistics for A2P1-AFP-C-01, Part 1

	PRIMARY COCs				
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Total Uranium
A2P1-AFP-C-1-01-RM	0.83 -	0.50 -	0.49 -	0.50 -	2.93 -
A2P1-AFP-C-1-03-RM	1.05 -	0.61 -	0.59 -	0.61 -	3.00 -
A2P1-AFP-C-1-04-RM	1.11 -	0.79 -	0.81 -	0.79 -	1.56 -
A2P1-AFP-C-1-05-RM	1.58 -	1.18 -	1.15 -	1.18 -	4.93 -
A2P1-AFP-C-1-05-RM-D	1.58 -	1.21 -	1.22 -	1.21 -	3.64 -
A2P1-AFP-C-1-07-RM	0.86 -	0.61 -	0.61 -	0.61 -	3.84 -
A2P1-AFP-C-1-08-RM	0.90 -	0.59 -	0.61 -	0.59 -	3.48 -
A2P1-AFP-C-1-10-RM	1.28 -	0.93 -	0.92 -	0.93 -	4.07 -
A2P1-AFP-C-1-11-RM	1.00 -	0.70 -	0.66 -	0.70 -	3.55 -
A2P1-AFP-C-1-12-RM	1.64 -	1.26 -	1.23 -	1.26 -	2.62 -
A2P1-AFP-C-1-13-RM	1.36 -	1.08 -	1.04 -	1.08 -	4.34 -
A2P1-AFP-C-1-14-RM	1.45 -	1.16 -	1.12 -	1.16 -	3.19 -
A2P1-AFP-C-1-16-RM	0.86 -	0.62 -	0.59 -	0.62 -	2.79 -
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	1.64 @	1.26 @	1.23 @	1.21 @	4.93 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--
a posteriori Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

Definition of Qualifiers
J" = estimated result
UJ" = not detected, estimated
U" = not detected
- " = no data qualifier
NV" = not validated
UNV" = not detected, not validated

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

(2) The maximum value of the two duplicates was used in all statistical equations.

(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.

(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A2P1-AFP-C-01, Part 2

	SECONDARY COCs					
Sample ID	Antimony	Arsenic	Beryllium	Cadmium	Molybdenum	Silver
A2P1-AFP-C-1-01-RM	3.48 -	7.28 -	0.19 -	0.76 -	0.42 -	0.49 U
A2P1-AFP-C-1-03-RM	4.88 -	7.57 -	0.12 -	0.58 -	0.75 -	0.51 U
A2P1-AFP-C-1-04-RM	5.42 -	6.20 -	0.07 -	0.48 -	0.60 -	0.51 U
A2P1-AFP-C-1-05-RM	2.35 -	12.4 -	1.20 -	1.27 -	0.42 U	0.52 U
A2P1-AFP-C-1-05-RM-D	4.30 -	14.00 -	0.95 -	0.90 -	0.41 U	0.50 U
A2P1-AFP-C-1-07-RM	4.51 -	7.43 -	0.19 -	0.51 -	0.40 U	0.49 U
A2P1-AFP-C-1-08-RM	4.55 -	7.47 -	0.09 -	0.74 -	0.79 -	0.46 U
A2P1-AFP-C-1-10-RM	4.53 -	3.92 U	0.36 -	0.81 -	0.42 U	0.52 U
A2P1-AFP-C-1-11-RM	4.20 -	12.60 -	0.32 -	0.79 -	0.39 U	0.48 U
A2P1-AFP-C-1-12-RM	3.38 -	16.30 -	1.05 -	1.34 -	0.43 U	0.52 U
A2P1-AFP-C-1-13-RM	2.04 -	8.84 -	0.03 U	0.73 -	0.40 U	0.49 U
A2P1-AFP-C-1-14-RM	2.58 -	11.30 -	0.09 -	0.54 -	0.40 U	0.49 U
A2P1-AFP-C-1-16-RM	6.40 -	3.84 U	0.06 -	0.43 -	0.41 U	0.51 U
FRL	96.00	12.00	1.50	82.00	2900.00	29000.00
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Confidence Level	90%	90%	90%	90%	90%	90%
Max Result	6.40 @	16.3	1.20 @	1.34 @	0.79 @	0.52 @
Standardized Skewness	- -	- -	- -	- -	- -	- -
W-Statistic Probability*	- -	53.5 % (N)	- -	- -	- -	- -
Test Procedure	- -	Wilcoxon	- -	- -	- -	- -
Sample Size	12	12	12	12	12	12
Estimated Mean	- -	7.52	- -	- -	- -	- -
UCL on the Mean**	- -	- -	- -	- -	- -	- -
Non-Parametric Prob.	- -	0.81%	- -	- -	- -	- -
Est. Mean - Pass / Fail	- -	Pass	- -	- -	- -	- -
2x Rule Pass / Fail	- -	Pass	- -	- -	- -	- -
a posteriori Sample	- -	10	- -	- -	- -	- -
Size calculation	- -	Pass	- -	- -	- -	- -

Definition of Qualifiers
J" = estimated result
UJ" = not detected, estimated
U" = not detected
- " = no data qualifier
NV" = not validated
UNV" = not detected, not validated

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

(2) The maximum value of the two duplicates was used in all statistical equations.

(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.

(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

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Appendix A: Certification Statistics for A2P1-AFP-C-02, Part 1

	PRIMARY COCs				
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Total Uranium
A2P1-AFP-C-2-01-RM	1.47 -	1.16 -	1.16 -	1.16 -	4.70 -
A2P1-AFP-C-2-02-RM	1.00 -	0.64 -	0.66 -	0.64 -	13.48 -
A2P1-AFP-C-2-04-RM	1.27 -	0.90 -	0.90 -	0.90 -	15.82 -
A2P1-AFP-C-2-06-RM	5.43 J	1.20 J	1.18 J	1.20 J	34.90 J
A2P1-AFP-C-2-07-RM	1.19 -	1.02 -	0.95 -	1.02 -	5.26 -
A2P1-AFP-C-2-08-RM	1.21 -	0.89 -	0.90 -	0.89 -	8.31 -
A2P1-AFP-C-2-10-RM	0.83 J	0.47 J	0.46 J	0.47 J	9.18 J
A2P1-AFP-C-2-10-RM-D	0.70 J	0.49 -	0.48 -	0.49 -	5.50 J
A2P1-AFP-C-2-11-RM	1.25 -	0.96 -	0.94 -	0.96 -	3.33 J
A2P1-AFP-C-2-12-RM	0.84 -	0.67 -	0.66 -	0.67 -	6.68 -
A2P1-AFP-C-2-13-RM	1.23 -	0.64 -	0.62 -	0.64 -	14.25 -
A2P1-AFP-C-2-15-RM	1.07 -	0.66 -	0.64 -	0.66 -	7.94 -
A2P1-AFP-C-2-16-RM	1.04 -	0.62 -	0.61 -	0.62 -	12.06 -
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	5.43	1.20 @	1.18 @	1.20 @	34.90 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	<0.01% (LN)	--	--	--	--
Test Procedure	Median	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	1.2	--	--	--	--
UCL on the Mean**	1.27	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	Pass	--	--	--	--
2x Rule Pass / Fail	Fail	--	--	--	--
a posteriori Sample Size calculation	7	--	--	--	--
	Pass	--	--	--	--

Definition of Qualifiers
J" = estimated result
UJ" = not detected, estimated
U" = not detected
- " = no data qualifier
NV" = not validated
UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A2P1-AFP-C-02, Part 2

	SECONDARY COCs					
Sample ID	**Antimony**	**Arsenic**	**Beryllium**	**Cadmium**	**Molybdenum**	**Silver**
A2P1-AFP-C-2-01-RM	3.66 -	12.10 -	0.51 -	1.14 -	2.04 -	0.53 U
A2P1-AFP-C-2-02-RM	5.18 -	9.67 -	0.19 -	0.45 -	2.20 -	0.53 U
A2P1-AFP-C-2-04-RM	4.03 -	4.83 -	0.37 -	0.81 -	2.01 -	0.56 U
A2P1-AFP-C-2-06-RM	4.65 -	5.82 -	0.04 U	0.41 -	1.68 -	0.57 U
A2P1-AFP-C-2-07-RM	1.64 U	6.80 -	0.04 U	0.58 -	1.43 -	0.56 U
A2P1-AFP-C-2-08-RM	4.61 -	11.5 -	0.22 -	0.92 -	1.24 -	0.56 U
A2P1-AFP-C-2-10-RM	4.81 -	4.80 -	0.10 -	0.42 -	1.51 -	0.52 U
A2P1-AFP-C-2-10-RM-D	3.36 -	3.81 U	0.15 -	0.53 -	0.68 -	0.50 U
A2P1-AFP-C-2-11-RM	1.66 -	8.46 -	0.38 -	0.99 -	1.12 -	0.51 U
A2P1-AFP-C-2-12-RM	2.60 -	8.54 -	0.20 -	0.66 -	1.01 -	0.50 U
A2P1-AFP-C-2-13-RM	3.45 -	5.75 -	0.03 U	0.32 -	1.04 -	0.48 U
A2P1-AFP-C-2-15-RM	3.38 -	9.07 -	0.03 U	0.31 -	0.92 -	0.45 U
A2P1-AFP-C-2-16-RM	4.16 -	8.13 -	0.08 -	0.55 -	1.04 -	0.44 U
FRL	96.00	12.00	1.50	82.00	2900.00	29000.00
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Confidence Level	90%	90%	90%	90%	90%	90%
Max Result	5.18 @	12.1	0.51 @	1.14 @	2.20 @	0.57 @
Standardized Skewness	--	--	--	--	--	--
W-Statistic Probability*	--	48.3% (N)	--	--	--	--
Test Procedure	--	t-Test (N)	--	--	--	--
Sample Size	12	12	12	12	12	12
Estimated Mean	--	7.96	--	--	--	--
UCL on the Mean**	--	8.91	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	Pass	--	--	--	--
2x Rule Pass / Fail	--	Pass	--	--	--	--
a posteriori Sample	--	3	--	--	--	--
Size calculation	--	Pass	--	--	--	--

Definition of Qualifiers
J" = estimated result
UJ" = not detected, estimated
U" = not detected
- " = no data qualifier
NV" = not validated
UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A2P1-AFP-C-03, Part 1

	PRIMARY COCs				
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Total Uranium
A2P1-AFP-C-3-01-RM	1.08 -	0.74 -	0.73 -	0.74 -	4.22 J
A2P1-AFP-C-3-01-RM-D	1.04 -	0.72 -	0.70 -	0.72 -	1.82 U
A2P1-AFP-C-3-02-RM	0.72 -	0.55 -	0.56 -	0.55 -	2.76 J
A2P1-AFP-C-3-03-RM	1.17 -	0.98 -	0.97 -	0.98 -	4.72 -
A2P1-AFP-C-3-06-RM	1.24 -	1.01 -	0.98 -	1.01 -	2.69 J
A2P1-AFP-C-3-07-RM	1.09 -	0.89 -	0.87 -	0.89 -	3.28 J
A2P1-AFP-C-3-08-RM	1.05 -	0.88 -	0.85 -	0.88 -	2.48 J
A2P1-AFP-C-3-10-RM	0.83 -	0.48 -	0.47 -	0.48 -	0.78 U
A2P1-AFP-C-3-11-RM	1.03 -	0.86 -	0.85 -	0.86 -	2.78 J
A2P1-AFP-C-3-12-RM	1.12 -	0.84 -	0.83 -	0.84 -	1.96 U
A2P1-AFP-C-3-14-RM	0.76 -	0.56 -	0.54 -	0.56 -	1.90 U
A2P1-AFP-C-3-15-RM	1.32 -	1.07 -	1.06 -	1.07 -	3.52 J
A2P1-AFP-C-3-16-RM	1.60 -	1.24 -	1.20 -	1.24 -	4.20 J
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	1.60 @	1.24 @	1.20 @	1.24 @	4.72 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--
a posteriori Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

Definition of Qualifiers
J" = estimated result
UJ" = not detected, estimated
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- " = no data qualifier
NV" = not validated
UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A2P1-AFP-C-03, Part 2

	SECONDARY COCs					
Sample ID	Antimony	Arsenic	Beryllium	Cadmium	Molybdenum	Silver
A2P1-AFP-C-3-01-RM	3.49 -	12.50 -	0.08 -	0.78 -	0.92 -	0.50 U
A2P1-AFP-C-3-01-RM-D	5.01 -	8.62 -	0.03 U	0.64 -	2.64 -	0.46 U
A2P1-AFP-C-3-02-RM	5.34 -	5.98 -	0.03 U	0.37 -	1.46 -	0.47 U
A2P1-AFP-C-3-03-RM	2.70 -	7.51 -	0.42 -	0.84 -	0.43 U	0.53 U
A2P1-AFP-C-3-06-RM	3.98 -	10.40 -	0.04 U	0.72 -	0.46 U	0.57 U
A2P1-AFP-C-3-07-RM	3.72 -	4.54 -	0.04 -	0.79 -	0.60 -	0.51 U
A2P1-AFP-C-3-08-RM	5.72 -	4.53 -	0.04 -	0.60 -	1.15 -	0.50 U
A2P1-AFP-C-3-10-RM	3.45 -	3.88 -	0.03 U	0.18 -	0.37 U	0.45 U
A2P1-AFP-C-3-11-RM	3.16 -	7.03 -	0.03 U	0.72 -	0.39 U	0.47 U
A2P1-AFP-C-3-12-RM	3.79 -	6.90 -	0.03 U	0.66 -	0.47 -	0.49 U
A2P1-AFP-C-3-14-RM	4.71 -	3.79 -	0.03 U	0.68 -	0.52 -	0.47 U
A2P1-AFP-C-3-15-RM	5.21 -	10.20 -	0.10 U	0.89 -	0.82 -	0.52 U
A2P1-AFP-C-3-16-RM	2.51 -	16.60 -	0.03 U	1.15 -	1.63 -	0.49 U
FRL	96.00	12.00	1.50	82.00	2900.00	29000.00
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Confidence Level	90%	90%	90%	90%	90%	90%
Max Result	5.72 @	16.6	0.42 @	1.15 @	2.64 @	0.57 @
Standardized Skewness	--	--	--	--	--	--
W-Statistic Probability*	--	56.1% (LN)	--	--	--	--
Test Procedure	--	t-Test (LN)	--	--	--	--
Sample Size	12	12	12	12	12	12
Estimated Mean	--	7.88	--	--	--	--
UCL on the Mean**	--	9.85	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	Pass	--	--	--	--
2x Rule Pass / Fail	--	Pass	--	--	--	--
a posteriori Sample	--	5	--	--	--	--
Size calculation	--	Pass	--	--	--	--

Definition of Qualifiers
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NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

(2) The maximum value of the two duplicates was used in all statistical equations.

(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.

(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A2P1-AFP-C-04, Part 1

	PRIMARY COCs				
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Total Uranium
A2P1-AFP-C-4-01-RM	0.87 -	0.62 -	0.62 -	0.62 -	2.77 J
A2P1-AFP-C-4-03-RM	0.84 -	0.49 -	0.47 -	0.49 -	2.57 J
A2P1-AFP-C-4-04-RM	1.20 -	0.86 -	0.83 -	0.86 -	3.23 J
A2P1-AFP-C-4-04-RM-D	1.20 -	0.92 -	0.93 -	0.92 -	4.10 J
A2P1-AFP-C-4-05-RM	1.18 -	0.82 -	0.80 -	0.82 -	3.90 J
A2P1-AFP-C-4-06-RM	1.27 -	0.75 -	0.70 -	0.75 -	3.52 J
A2P1-AFP-C-4-08-RM	1.04 -	0.68 -	0.67 -	0.68 -	1.42 U
A2P1-AFP-C-4-09-RM	1.18 -	0.93 -	0.92 -	0.93 -	2.31 U
A2P1-AFP-C-4-10-RM	1.36 -	1.05 -	1.02 -	1.05 -	2.33 U
A2P1-AFP-C-4-11-RM	1.12 -	0.88 -	0.83 -	0.88 -	2.83 J
A2P1-AFP-C-4-13-RM	1.34 -	0.94 -	0.94 -	0.94 -	3.74 J
A2P1-AFP-C-4-14-RM	0.89 -	0.61 -	0.58 -	0.61 -	0.51 U
A2P1-AFP-C-4-15-RM	1.52 -	1.18 -	1.17 -	1.18 -	1.30 U
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	1.36 @	1.18 @	1.17 @	1.18 @	4.10 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--
a posteriori Sample Size calculation	-- --	-- --	-- --	-- --	-- --

Definition of Qualifiers
J" = estimated result
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NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A2P1-AFP-C-04, Part 2

	SECONDARY COCs					
Sample ID	Antimony	Arsenic	Beryllium	Cadmium	Molybdenum	Silver
A2P1-AFP-C-4-01-RM	2.85 U	5.18 -	0.17 -	0.87 -	0.39 UJ	0.47 U
A2P1-AFP-C-4-03-RM	3.24 U	3.47 U	0.13 -	0.60 -	0.94 J	0.46 U
A2P1-AFP-C-4-04-RM	4.02 U	11.20 J	0.13 -	0.71 -	1.15 J	0.50 U
A2P1-AFP-C-4-04-RM-D	4.27 U	5.74 J	0.04 -	0.49 -	0.38 UJ	0.47 U
A2P1-AFP-C-4-05-RM	3.02 U	9.21 -	0.08 -	0.57 -	0.42 UJ	0.51 U
A2P1-AFP-C-4-06-RM	4.03 U	5.72 -	0.16 -	0.41 -	0.40 UJ	0.49 U
A2P1-AFP-C-4-08-RM	6.02 U	6.79 -	0.09 -	0.52 -	0.41 UJ	0.50 U
A2P1-AFP-C-4-09-RM	4.35 U	4.85 -	0.08 -	0.72 -	0.45 J	0.50 U
A2P1-AFP-C-4-10-RM	1.40 U	8.84 -	0.11 -	0.71 -	0.39 UJ	0.48 U
A2P1-AFP-C-4-11-RM	3.68 U	5.28 -	0.19 -	0.67 -	0.41 UJ	0.50 U
A2P1-AFP-C-4-13-RM	2.46 U	10.60 -	0.53 -	0.74 -	0.39 UJ	0.47 U
A2P1-AFP-C-4-14-RM	5.23 U	3.68 U	0.03 U	0.18 -	0.40 UJ	0.48 U
A2P1-AFP-C-4-15-RM	3.60 U	9.42 -	0.48 -	0.94 -	0.70 J	0.52 U
FRL	96.00	12.00	1.50	82.00	2900.00	29000.00
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Confidence Level	90%	90%	90%	90%	90%	90%
Max Result	6.02 @	11.20 @	0.53 @	0.94 @	1.15 @	0.52 @
Standardized Skewness	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--
a posteriori Sample Size calculation	--	--	--	--	--	--

Definition of Qualifiers
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NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

(2) The maximum value of the two duplicates was used in all statistical equations.

(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.

(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A2P1-AFP-C-05, Part 1

	PRIMARY COCs					SECONDARY
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Total Uranium	Neptunium-237
A2P1-AFP-C-5-02-RM	1.23 -	0.98 -	0.97 -	0.98 -	1.68 UJ	0.00 U
A2P1-AFP-C-5-02-RM-	1.34 -	0.98 -	0.98 -	0.98 -	2.49 UJ	0.00 U
A2P1-AFP-C-5-03-RM	0.76 -	0.60 -	0.59 -	0.60 -	2.63 UJ	0.00 U
A2P1-AFP-C-5-04-RM	0.78 -	0.66 -	0.67 -	0.66 -	2.32 UJ	0.00 U
A2P1-AFP-C-5-06-RM	0.85 -	0.65 -	0.66 -	0.65 -	1.88 UJ	0.00 U
A2P1-AFP-C-5-07-RM	0.57 -	0.43 -	0.42 -	0.43 -	2.32 J	0.00 U
A2P1-AFP-C-5-08-RM	0.88 -	0.74 -	0.72 -	0.74 -	2.27 UJ	0.00 U
A2P1-AFP-C-5-09-RM	0.73 -	0.57 -	0.55 -	0.57 -	1.83 UJ	0.00 U
A2P1-AFP-C-5-11-RM	0.82 -	0.62 -	0.58 -	0.62 -	1.57 UJ	0.00 U
A2P1-AFP-C-5-12-RM	0.68 -	0.65 -	0.64 -	0.65 -	2.24 UJ	0.00 U
A2P1-AFP-C-5-13-RM	0.93 -	0.72 -	0.69 -	0.72 -	0.74 UJ	0.00 U
A2P1-AFP-C-5-14-RM	0.94 -	0.68 -	0.68 -	0.68 -	2.84 J	0.00 U
A2P1-AFP-C-5-15-RM	0.75 -	0.56 -	0.53 -	0.56 -	4.05 J	0.00 U
FRL	1.70	1.80	1.70	1.50	82.00	3.20
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g	pCi/g
Confidence Level	95%	95%	95%	95%	95%	95%
Max Result	1.34 @	0.98 @	0.98 @	0.98 @	4.05 @	0.00 @
Standardized Skewness	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--

Definition of Qualifiers
J" = estimated result
UJ" = not detected, estimated
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NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

(2) The maximum value of the two duplicates was used in all statistical equations.

(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.

(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A2P1-AFP-C-05, Part 2

	SECONDARY COCs					
Sample ID	Antimony	Arsenic	Beryllium	Cadmium	Molybdenum	Silver
A2P1-AFP-C-5-02-RM	1.40 U	3.61 U	0.03 U	0.98 -	0.62 -	0.48 U
A2P1-AFP-C-5-02-RM-	2.58 -	3.70 U	0.08 -	0.63 -	1.94 -	0.49 U
A2P1-AFP-C-5-03-RM	3.48 -	3.62 U	0.03 U	0.47 -	1.47 -	0.48 U
A2P1-AFP-C-5-04-RM	3.37 -	3.67 U	0.06 -	0.52 -	0.47 -	0.48 U
A2P1-AFP-C-5-06-RM	4.20 -	8.43 -	0.10 -	0.62 -	1.70 -	0.47 U
A2P1-AFP-C-5-07-RM	2.89 -	3.70 U	0.03 U	0.38 -	0.80 -	0.49 U
A2P1-AFP-C-5-08-RM	3.52 -	3.87 U	0.03 U	0.46 -	0.42 U	0.51 U
A2P1-AFP-C-5-09-RM	2.41 -	5.23 -	0.05 -	0.65 -	0.62 -	0.47 U
A2P1-AFP-C-5-11-RM	1.54 -	3.75 U	0.05 -	0.38 -	0.40 U	0.49 U
A2P1-AFP-C-5-12-RM	3.21 -	3.71 U	0.06 -	0.60 -	0.66 -	0.49 U
A2P1-AFP-C-5-13-RM	2.51 -	7.24 -	0.04 U	0.61 -	0.61 -	0.52 U
A2P1-AFP-C-5-14-RM	3.08 -	10.40 -	0.16 -	0.72 -	0.57 -	0.52 U
A2P1-AFP-C-5-15-RM	3.15 -	7.31 -	0.03 U	0.15 U	0.71 -	0.47 U
FRL	96.00	12.00	1.50	82.00	2900.00	29000.00
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Confidence Level	90%	90%	90%	90%	90%	90%
Max Result	4.20 @	10.40 @	0.16 @	0.98 @	1.94 @	0.52 @
Standardized Skewness	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--

Definition of Qualifiers
J" = estimated result
UJ" = not detected, estimated
U" = not detected
- " = no data qualifier
NV" = not validated
UNV" = not detected, not validated

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

(2) The maximum value of the two duplicates was used in all statistical equations.

(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.

(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

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Appendix A: Certification Statistics for A2P1-AFP-C-06, Part 1

	PRIMARY COCs				
Sample ID	Radium-226	Radium-228	Thorium-228	Thorium-232	Total Uranium
A2P1-AFP-C-6-01-RM	0.72 -	0.44 -	0.44 -	0.44 -	1.26 UJ
A2P1-AFP-C-6-03-RM	0.83 -	0.46 -	0.46 -	0.46 -	1.68 UJ
A2P1-AFP-C-6-04-RM	1.29 -	0.96 -	0.96 -	0.96 -	5.80 UJ
A2P1-AFP-C-6-05-RM	0.91 -	0.66 -	0.66 -	0.66 -	1.43 UJ
A2P1-AFP-C-6-05-RM-	0.85 -	0.56 -	0.58 -	0.56 -	3.40 J
A2P1-AFP-C-6-06-RM	0.94 -	0.69 -	0.67 -	0.69 -	0.99 UJ
A2P1-AFP-C-6-08-RM	0.94 -	0.67 -	0.69 -	0.67 -	0.94 UJ
A2P1-AFP-C-6-09-RM	0.89 -	0.65 -	0.67 -	0.65 -	12.24 -
A2P1-AFP-C-6-11-RM	0.98 -	0.71 -	0.70 -	0.71 -	2.54 UJ
A2P1-AFP-C-6-12-RM	0.92 -	0.66 -	0.68 -	0.66 -	5.16 UJ
A2P1-AFP-C-6-13-RM	0.69 -	0.34 -	0.33 -	0.34 -	1.90 UJ
A2P1-AFP-C-6-14-RM	0.93 -	0.53 -	0.52 -	0.53 -	1.22 UJ
A2P1-AFP-C-6-16-RM	1.11 -	0.81 -	0.82 -	0.81 -	4.10 UJ
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	1.29 @	0.96 @	0.96 @	0.96 @	12.24 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--
a posteriori Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

Definition of Qualifiers
J" = estimated result
UJ" = not detected, estimated
U" = not detected
- " = no data qualifier
NV" = not validated
UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Appendix A: Certification Statistics for A2P1-AFP-C-06, Part 2

	SECONDARY COCs					
Sample ID	Antimony	Arsenic	Beryllium	Cadmium	Molybdenum	Silver
A2P1-AFP-C-6-01-RM	4.45 -	9.99 -	0.03 U	0.57 -	0.98 -	0.45 U
A2P1-AFP-C-6-03-RM	2.82 -	3.79 U	0.12 -	0.30 -	1.19 -	0.50 U
A2P1-AFP-C-6-04-RM	1.51 U	4.35 -	0.36 -	0.92 -	0.96 -	0.48 U
A2P1-AFP-C-6-05-RM	4.27 -	6.98 -	0.20 -	0.51 -	1.44 -	0.47 U
A2P1-AFP-C-6-05-RM-	4.73 -	3.42 -	0.07 -	0.35 -	1.16 -	0.45 U
A2P1-AFP-C-6-06-RM	4.71 -	4.8 -	0.17 -	0.34 -	0.89 -	0.48 U
A2P1-AFP-C-6-08-RM	2.72 -	3.52 U	0.06 -	0.44 -	0.99 -	0.46 U
A2P1-AFP-C-6-09-RM	4.69 -	3.70 U	0.30 -	0.44 -	1.28 -	0.49 U
A2P1-AFP-C-6-11-RM	4.08 -	4.18 -	0.06 -	0.42 -	0.93 -	0.46 U
A2P1-AFP-C-6-12-RM	4.67 -	7.89 -	0.28 -	0.39 -	0.50 -	0.48 U
A2P1-AFP-C-6-13-RM	4.34 -	3.33 U	0.03 U	0.42 -	0.69 -	0.44 U
A2P1-AFP-C-6-14-RM	4.26 -	4.59 -	0.03 U	0.44 -	0.89 -	0.49 U
A2P1-AFP-C-6-16-RM	5.69 -	11.80 -	0.15 -	0.73 -	1.07 -	0.52 U
FRL	96.00	12.00	1.50	82.00	2900.00	29000.00
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Confidence Level	90%	90%	90%	90%	90%	90%
Max Result	4.73 @	11.80 @	0.36 @	0.92 @	1.44 @	0.52 @
Standardized Skewness	--	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Estimated Mean	--	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--	--
Est. Mean - Pass / Fail	--	--	--	--	--	--
2x Rule Pass / Fail	--	--	--	--	--	--
a posteriori Sample	--	--	--	--	--	--
Size calculation	--	--	--	--	--	--

Definition of Qualifiers
J" = estimated result
UJ" = not detected, estimated
U" = not detected
- " = no data qualifier
NV" = not validated
UNV" = not detected, not validated

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

(2) The maximum value of the two duplicates was used in all statistical equations.

(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.

(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

APPENDIX B

APPROVAL AND VARIANCE/FIELD CHANGE NOTICES TO THE CERTIFICATION SAMPLING PSP

VARIANCE LOG FOR PROJECT SPECIFIC PLAN FOR CERTIFICATION SAMPLING OF THE AREA 2, PHASE I ACTIVE FLYASH PILE FOOTPRINT AND ADJACENT AREA EAST OF THE SOUTH CONSTRUCTION ROAD

Variance No.	Variance Date	Variance Description	Significant? (Y or N)	Date Signed	Date Distributed	EPA/OEPA Approval
20402-PSP-0003-1	10/24/00	Adds Neptunium-237 as a secondary ASCOC for CU A2P1-AFP-05.	Y	10/25/00	10/31/00	10/30/00
20402-PSP-0003-2	11/15/00	Correct Figure 2-2 for sample ids and Appendix B for CU/sample id.	N	11/16/00	11/17/00	N/A
20402-PSP-0003-3	1/4/01	Documents the collection of archive samples in CU 3	N	1/4/01	1/9/01	N/A

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8462

OhioEPA
State of Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
Dayton, Ohio 45402-2911
(513) 285-6357
FAX (513) 285-6249

Post-it® Fax Note 7671	Date [redacted]	# of pages ▶ 1
To J D Chiou	From OEPA	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # X 5131	Fax #	

3462

MEMO

TO: J.D. Chiou

FROM: Donna Bohannon (DB)

DATE: October 30, 2000

SUBJECT: **V/FCN 20402-PSP-0002-1** for the *PSP fro Certification Sampling of the Area 2, Phase I Active Flyash Pile Footprint and Adjacent Area East of the South Construction Road*

This V/FCN adds the analysis of neptunium-237 for CU A2PI-AFP-05 on Table 3-1, nitric acid preservative for liquid metals, edits Table 3-2 to include a neptunium-237 FRL of 3.2 pCi/g and MDC of .32 pCi/g, and modifies Appendix B to incorporate the corrections. Ohio EPA approves these changes.

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VARIANCE / FIELD CHANGE NOTICE	V/FCN 20402PSP3-1
WBS NO.: PROJECT/DOCUMENT/ECDC #20402-PSP-0003 Rev 1	Page 1 of 4
PROJECT TITLE: PSP for Certification Sampling for Area 2, Phase I Active Flyash Pile Footprint and Adjacent Area East of the South Construction Road	Date: 10/24/00

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This Variance/Field Change Notice (V/FCN) documents the following two items:

Item 1 – Edit Table 3-1 to add analysis for neptunium-237 for CU A2P1-AFP-05 only. Attached is the modified Table 3-1. The modified table also corrects the preservation for the liquid metals samples to include HNO_3 to pH < 2.

Item 2 – Edit Table 3-2 and create TAL 20402-PSP-0003-C to add the neptunium-237 analyte with an FRL limit of 3.2 pCi/g and an MDC of 0.32 pCi/g. Attached is the modified Table 3-2 and TAL 20402-PSP-0003-C. Also add TAL C to the sampling table in Appendix B for CU A2P1-AFP-05. The modified Appendix B is also attached.

INFORMATION ONLY

Justification

Item 1- The analyte was added to CU A2P1-AFP-05 to certify the remediation of an above-FRL neptunium-237 concentration location.

Item 2- The TAL needs to be generated for neptunium-237.

REQUESTED BY: Mike Rolfes DATE: 10/24/00

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE R Hale FOR F Thompson	10-25-00	X	Area 2 PROJECT MANAGER	10-25-00
	DATA QUALITY MANAGEMENT			Real-time Program Mgr	
X	[illegible]	10/25/00	X	Area 2 Characterization Lead	10/25/00
X	Sampling Manager Tom Bubelage	10/25/00		WAO	

VARIANCE/FCN APPROVED [X]YES [ ]NO

REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION

PROJECT MANAGER:	DOCUMENT CONTROL: Jeannie Rosser	OTHER:
QUALITY ASSURANCE:	OTHER:	OTHER:

TABLE 3-1
SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte	Method	Sample Matrix	Lab	ASL	Preserve	Holding Time	Container	Sample Mass
Total Uranium, Radium-226, Radium-228, Thorium-228, Thorium-232, Neptunium-237	Alpha or Gamma Spectroscopy	Solid	On-site or off-site	E[a]	None	12 months	Plastic or stainless steel core liner or glass or polyethylene sample container[b]	300 grams
Arsenic, Beryllium, Antimony, Cadmium, Molybdenum, Silver	ICP or ICP/MS	Solid	On-site or off-site	D	Cool, 4°C	6 months	Collect in same core liner as rad sample[b]	20 grams
Total Uranium, Radium-226, Radium-228, Thorium-228, Thorium-232, Neptunium-237	Alpha or Gamma Spectroscopy	Liquid (rinsate/ container blank)	On-site or off-site	E[a]	HNO_3 to pH<2	6 months	1 liter polyethylene	8 liters
Arsenic, Beryllium, Antimony, Cadmium, Molybdenum, Silver	ICP or ICP/MS	Liquid (rinsate/ container blank)	On-site or off-site	D	Cool, 4°C HNO_3 to pH<2	6 months	500 ml polyethylene[c]	500 ml[c]

[a] The SCQ highest allowable minimum detectable concentration (HAMDC) for total uranium, thorium-228, and thorium-232 by gamma spectroscopy at Analytical Support Level (ASL) D is more stringent the minimum detectable concentration (MDC) needed for this certification. The MDC needed for this certification event is 10 percent of the FRL. Thus, the data deliverable for total uranium, thorium-228, and thorium-232 analysis by gamma spectroscopy will be identical in specifications for ASL D except for the HAMDC. As a result, the total uranium, thorium-228, and thorium-232 gamma spectroscopy data are considered ASL E.

[b] Soil samples for metals analysis can not be collected or submitted in stainless steel liners. The SCQ specifies glass containers with teflon lined caps; however, polyethylene containers (core liners) may also be used as allowed by Contract Laboratory Program (CLP) procedure ILM04.0.

[c] The SCQ specifies collection of 1-liter samples for metals analysis; however, this volume is adequate for field QC since laboratory QC is not required.

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MDM 10/24/00

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TABLE 3-2
A2PI AFP CERTIFICATION SAMPLING
TARGET ANALYTE LIST

TAL 20402-PSP-0003-C
Alpha or Gamma Spectroscopy Method
(ASL D)

Analyte	FRL or BTV Limit	MDC
Neptunium-237	3.2 pCi/g	0.32 pCi/g

V)FCN 20402P3P3-1
pg. 4 of 4
MKK 10/24/00

APPENDIX B
A2PI AFP AREA CERTIFICATION SAMPLES

CERTIFICATION UNIT	SAMPLE ID	ANALYSIS	NORTHING	EASTING
A2P1-AFP-3-C	A2P1-AFP-3-C-14-RM	TAL A/B	477201	1348668
A2P1-AFP-3-C	A2P1-AFP-3-C-15-RM	TAL A/B	477262	1348681
A2P1-AFP-3-C	A2P1-AFP-3-C-16-RM	TAL A/B	477328	1348683
A2P1-AFP-4-C	A2P1-AFP-4-C-01-RM	TAL A/B	477222	1348271
A2P1-AFP-4-C	A2P1-AFP-4-C-02-RM	ARCHIVE	477186	1348314
A2P1-AFP-4-C	A2P1-AFP-4-C-03-RM	TAL A/B	477160	1348367
A2P1-AFP-4-C	A2P1-AFP-4-C-04-RM	TAL A/B	477139	1348414
A2P1-AFP-4-C	A2P1-AFP-4-C-04-RM-D	TAL A/B	477139	1348414
A2P1-AFP-4-C	A2P1-AFP-4-C-05-RM	TAL A/B	477139	1348465
A2P1-AFP-4-C	A2P1-AFP-4-C-06-RM	TAL A/B	477125	1348502
A2P1-AFP-4-C	A2P1-AFP-4-C-07-RM	ARCHIVE	477168	1348458
A2P1-AFP-4-C	A2P1-AFP-4-C-08-RM	TAL A/B	477155	1348520
A2P1-AFP-4-C	A2P1-AFP-4-C-09-RM	TAL A/B	477117	1348549
A2P1-AFP-4-C	A2P1-AFP-4-C-10-RM	TAL A/B	477135	1348577
A2P1-AFP-4-C	A2P1-AFP-4-C-11-RM	TAL A/B	477155	1348550
A2P1-AFP-4-C	A2P1-AFP-4-C-12-RM	ARCHIVE	477179	1348573
A2P1-AFP-4-C	A2P1-AFP-4-C-13-RM	TAL A/B	477152	1348610
A2P1-AFP-4-C	A2P1-AFP-4-C-14-RM	TAL A/B	477204	1348602
A2P1-AFP-4-C	A2P1-AFP-4-C-15-RM	TAL A/B	477210	1348641
A2P1-AFP-4-C	A2P1-AFP-4-C-16-RM	ARCHIVE	477242	1348656
A2P1-AFP-5-C	A2P1-AFP-5-C-01-RM	ARCHIVE	477220	1348385
A2P1-AFP-5-C	A2P1-AFP-5-C-02-RM	TAL A/B/C	477187	1348417
A2P1-AFP-5-C	A2P1-AFP-5-C-02-RM-D	TAL A/B/C	477187	1348417
A2P1-AFP-5-C	A2P1-AFP-5-C-03-RM	TAL A/B/C	477283	1348421
A2P1-AFP-5-C	A2P1-AFP-5-C-04-RM	TAL A/B/C	477298	1348468
A2P1-AFP-5-C	A2P1-AFP-5-C-05-RM	ARCHIVE	477203	1348495
A2P1-AFP-5-C	A2P1-AFP-5-C-06-RM	TAL A/B/C	477252	1348483
A2P1-AFP-5-C	A2P1-AFP-5-C-07-RM	TAL A/B/C	477252	1348544
A2P1-AFP-5-C	A2P1-AFP-5-C-08-RM	TAL A/B/C	477244	1348594
A2P1-AFP-5-C	A2P1-AFP-5-C-09-RM	TAL A/B/C	477363	1348441
A2P1-AFP-5-C	A2P1-AFP-5-C-10-RM	ARCHIVE	477346	1348510
A2P1-AFP-5-C	A2P1-AFP-5-C-11-RM	TAL A/B/C	477436	1348488
A2P1-AFP-5-C	A2P1-AFP-5-C-12-RM	TAL A/B/C	477398	1348568
A2P1-AFP-5-C	A2P1-AFP-5-C-13-RM	TAL A/B/C	477310	1348564
A2P1-AFP-5-C	A2P1-AFP-5-C-14-RM	TAL A/B/C	477293	1348648
A2P1-AFP-5-C	A2P1-AFP-5-C-15-RM	TAL A/B/C	477353	1348593
A2P1-AFP-5-C	A2P1-AFP-5-C-16-RM	ARCHIVE	477346	1348651
A2P1-AFP-6-C	A2P1-AFP-6-C-01-RM	TAL A/B	477229	1348314
A2P1-AFP-6-C	A2P1-AFP-6-C-02-RM	ARCHIVE	477243	1348351
A2P1-AFP-6-C	A2P1-AFP-6-C-03-RM	TAL A/B	477268	1348289
A2P1-AFP-6-C	A2P1-AFP-6-C-04-RM	TAL A/B	477287	1348257
A2P1-AFP-6-C	A2P1-AFP-6-C-05-RM	TAL A/B	477370	1348300
A2P1-AFP-6-C	A2P1-AFP-6-C-05-RM-D	TAL A/B	477370	1348300
A2P1-AFP-6-C	A2P1-AFP-6-C-06-RM	TAL A/B	477318	1348305
A2P1-AFP-6-C	A2P1-AFP-6-C-07-RM	ARCHIVE	477330	1348346
A2P1-AFP-6-C	A2P1-AFP-6-C-08-RM	TAL A/B	477291	1348373
A2P1-AFP-6-C	A2P1-AFP-6-C-09-RM	TAL A/B	477400	1348318
A2P1-AFP-6-C	A2P1-AFP-6-C-10-RM	ARCHIVE	477388	1348352

VARIANCE / FIELD CHANGE NOTICE	V/FCN 20402PSP3-2
WBS NO.: PROJECT/DOCUMENT/ECDC #20402-PSP-0002 Rev 1	Page 1 of 5
PROJECT TITLE: PSP for Certification Sampling for Area 2, Phase I Active Flyash Pile Footprint and Adjacent Area East of the South Construction Road	Date: 11/15/00

- 3462

This Variance/Field Change Notice (V/FCN) documents the following changes:

1) The V/FCN corrects the duplication and mislabeling of sample points for CU-02 in Figure 2-2. The duplicate sample point –09 furthest to the north is actually sample point –08. The duplicate sample point -16 furthest to the north is actually sample point –13. Also the original sample point –08 is actually sample point -07. The attached Figure 2-2 supercedes the incorrect figure.

2) The V/FCN corrects the mislabeling of certification units (CU) and samples in Appendix B. Per Section 2.4.2, certification sample identifier ("C") is placed before the certification unit identifier ("CU"). For example, the correct CU and sample identification scheme is A2P1-AFP-C-1-01. The corrected Appendix B is attached.

Justification

Item 1- The coordinates are listed correctly in Appendix B, but the labeling was incorrect in the Figure 2-2.

Item 2- The correction to Appendix B allows for more accurate documentation.

REQUESTED BY: Mike Rolfes DATE: 11/15/00

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE Frank Thompson	11-16-00	X	Area 2 PROJECT MANAGER Thomas L. [illegible]	11-16-00
	DATA QUALITY MANAGEMENT			Real-time Program Mgr	
X	ANALYTICAL CUSTOMER SUPPORT Denise M Arce	11/16/00	X	Area 2 Characterization Lead [illegible]	11/16/00
X	Sampling Manager Tom Bubelage	11/16/00		WAD	

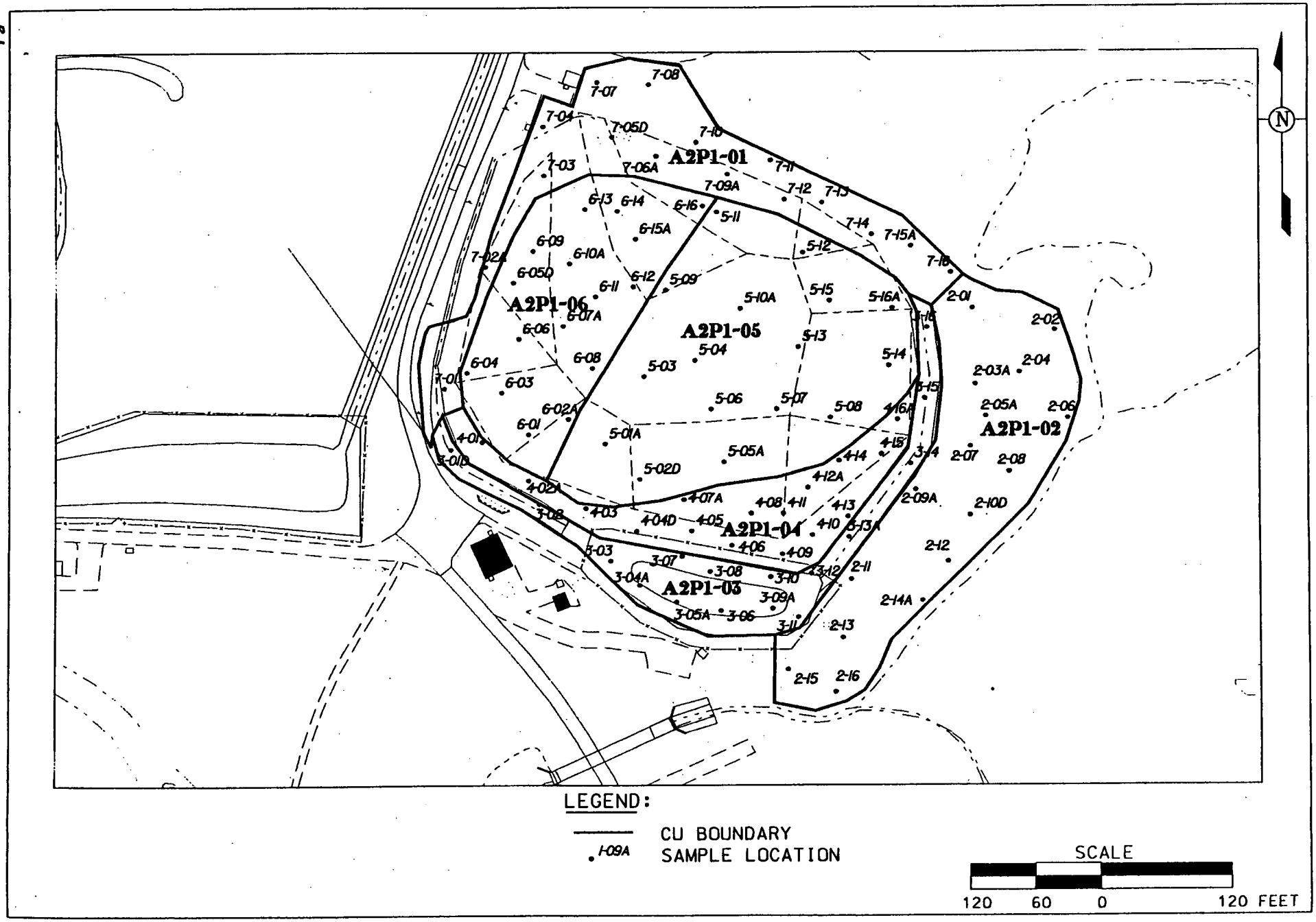
VARIANCE/FCN APPROVED [X]YES [ ]NO

REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION

PROJECT MANAGER:	DOCUMENT CONTROL: Jeannie Rouser	OTHER:
QUALITY ASSURANCE:	OTHER:	OTHER:

ORIGINAL



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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-2. A2P1 AFP AREA CU SAMPLE LOCATIONS

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11/16/00 MJR

APPENDIX B
A2PI AFP AREA CERTIFICATION SAMPLES

3462

CERTIFICATION UNIT	SAMPLE ID	ANALYSIS	NORTHING	EASTING
A2P1-AFP-C-1	A2P1-AFP-C-1-01-RM	TAL A/B	477272	1348236
A2P1-AFP-C-1	A2P1-AFP-C-1-02-RM	ARCHIVE	477385	1348274
A2P1-AFP-C-1	A2P1-AFP-C-1-03-RM	TAL A/B	477471	1348328
A2P1-AFP-C-1	A2P1-AFP-C-1-04-RM	TAL A/B	477517	1348327
A2P1-AFP-C-1	A2P1-AFP-C-1-05-RM	TAL A/B	477507	1348391
A2P1-AFP-C-1	A2P1-AFP-C-1-05-RM-D	TAL A/B	477507	1348391
A2P1-AFP-C-1	A2P1-AFP-C-1-06-RM	ARCHIVE	477489	1348432
A2P1-AFP-C-1	A2P1-AFP-C-1-07-RM	TAL A/B	477558	1348377
A2P1-AFP-C-1	A2P1-AFP-C-1-08-RM	TAL A/B	477556	1348425
A2P1-AFP-C-1	A2P1-AFP-C-1-09-RM	ARCHIVE	477472	1348498
A2P1-AFP-C-1	A2P1-AFP-C-1-10-RM	TAL A/B	477502	1348469
A2P1-AFP-C-1	A2P1-AFP-C-1-11-RM	TAL A/B	477485	1348538
A2P1-AFP-C-1	A2P1-AFP-C-1-12-RM	TAL A/B	477448	1348551
A2P1-AFP-C-1	A2P1-AFP-C-1-13-RM	TAL A/B	477445	1348586
A2P1-AFP-C-1	A2P1-AFP-C-1-14-RM	TAL A/B	477415	1348632
A2P1-AFP-C-1	A2P1-AFP-C-1-15-RM	ARCHIVE	477404	1348668
A2P1-AFP-C-1	A2P1-AFP-C-1-16-RM	TAL A/B	477379	1348705
A2P1-AFP-C-2	A2P1-AFP-C-2-01-RM	TAL A/B	477346	1348725
A2P1-AFP-C-2	A2P1-AFP-C-2-02-RM	TAL A/B	477325	1348801
A2P1-AFP-C-2	A2P1-AFP-C-2-03-RM	ARCHIVE	477275	1348727
A2P1-AFP-C-2	A2P1-AFP-C-2-04-RM	TAL A/B	477286	1348768
A2P1-AFP-C-2	A2P1-AFP-C-2-05-RM	ARCHIVE	477245	1348737
A2P1-AFP-C-2	A2P1-AFP-C-2-06-RM	TAL A/B	477243	1348813
A2P1-AFP-C-2	A2P1-AFP-C-2-07-RM	TAL A/B	477217	1348723
A2P1-AFP-C-2	A2P1-AFP-C-2-08-RM	TAL A/B	477193	1348759
A2P1-AFP-C-2	A2P1-AFP-C-2-09-RM	ARCHIVE	477177	1348673
A2P1-AFP-C-2	A2P1-AFP-C-2-10-RM	TAL A/B	477153	1348723
A2P1-AFP-C-2	A2P1-AFP-C-2-10-RM-D	TAL A/B	477153	1348723
A2P1-AFP-C-2	A2P1-AFP-C-2-11-RM	TAL A/B	477094	1348613
A2P1-AFP-C-2	A2P1-AFP-C-2-12-RM	TAL A/B	477110	1348702
A2P1-AFP-C-2	A2P1-AFP-C-2-13-RM	TAL A/B	477039	1348605
A2P1-AFP-C-2	A2P1-AFP-C-2-14-RM	ARCHIVE	477073	1348679
A2P1-AFP-C-2	A2P1-AFP-C-2-15-RM	TAL A/B	477010	1348554
A2P1-AFP-C-2	A2P1-AFP-C-2-16-RM	TAL A/B	476989	1348599
A2P1-AFP-C-3	A2P1-AFP-C-3-01-RM	TAL A/B	477215	1348242
A2P1-AFP-C-3	A2P1-AFP-C-3-01-RM-D	TAL A/B	477215	1348242
A2P1-AFP-C-3	A2P1-AFP-C-3-02-RM	TAL A/B	477164	1348324
A2P1-AFP-C-3	A2P1-AFP-C-3-03-RM	TAL A/B	477111	1348390
A2P1-AFP-C-3	A2P1-AFP-C-3-04-RM	ARCHIVE	477088	1348417
A2P1-AFP-C-3	A2P1-AFP-C-3-05-RM	ARCHIVE	477072	1348451
A2P1-AFP-C-3	A2P1-AFP-C-3-06-RM	TAL A/B	477064	1348492
A2P1-AFP-C-3	A2P1-AFP-C-3-07-RM	TAL A/B	477115	1348456
A2P1-AFP-C-3	A2P1-AFP-C-3-08-RM	TAL A/B	477101	1348482
A2P1-AFP-C-3	A2P1-AFP-C-3-09-RM	ARCHIVE	477066	1348540
A2P1-AFP-C-3	A2P1-AFP-C-3-10-RM	TAL A/B	477096	1348538
A2P1-AFP-C-3	A2P1-AFP-C-3-11-RM	TAL A/B	477058	1348564
A2P1-AFP-C-3	A2P1-AFP-C-3-12-RM	TAL A/B	477099	1348576
A2P1-AFP-C-3	A2P1-AFP-C-3-13-RM	ARCHIVE	477133	1348611

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11/16/04 JWR

APPENDIX B
A2PI AFP AREA CERTIFICATION SAMPLES

CERTIFICATION UNIT	SAMPLE ID	ANALYSIS	NORTHING	EASTING
A2P1-AFP-C-3	A2P1-AFP-C-3-14-RM	TAL A/B	477201	1348668
A2P1-AFP-C-3	A2P1-AFP-C-3-15-RM	TAL A/B	477262	1348681
A2P1-AFP-C-3	A2P1-AFP-C-3-16-RM	TAL A/B	477328	1348683
A2P1-AFP-C-4	A2P1-AFP-C-4-01-RM	TAL A/B	477222	1348271
A2P1-AFP-C-4	A2P1-AFP-C-4-02-RM	ARCHIVE	477186	1348314
A2P1-AFP-C-4	A2P1-AFP-C-4-03-RM	TAL A/B	477160	1348367
A2P1-AFP-C-4	A2P1-AFP-C-4-04-RM	TAL A/B	477139	1348414
A2P1-AFP-C-4	A2P1-AFP-C-4-04-RM-D	TAL A/B	477139	1348414
A2P1-AFP-C-4	A2P1-AFP-C-4-05-RM	TAL A/B	477139	1348465
A2P1-AFP-C-4	A2P1-AFP-C-4-06-RM	TAL A/B	477125	1348502
A2P1-AFP-C-4	A2P1-AFP-C-4-07-RM	ARCHIVE	477168	1348458
A2P1-AFP-C-4	A2P1-AFP-C-4-08-RM	TAL A/B	477155	1348520
A2P1-AFP-C-4	A2P1-AFP-C-4-09-RM	TAL A/B	477117	1348549
A2P1-AFP-C-4	A2P1-AFP-C-4-10-RM	TAL A/B	477135	1348577
A2P1-AFP-C-4	A2P1-AFP-C-4-11-RM	TAL A/B	477155	1348550
A2P1-AFP-C-4	A2P1-AFP-C-4-12-RM	ARCHIVE	477179	1348573
A2P1-AFP-C-4	A2P1-AFP-C-4-13-RM	TAL A/B	477152	1348610
A2P1-AFP-C-4	A2P1-AFP-C-4-14-RM	TAL A/B	477204	1348602
A2P1-AFP-C-4	A2P1-AFP-C-4-15-RM	TAL A/B	477210	1348641
A2P1-AFP-C-4	A2P1-AFP-C-4-16-RM	ARCHIVE	477242	1348656
A2P1-AFP-C-5	A2P1-AFP-C-5-01-RM	ARCHIVE	477220	1348385
A2P1-AFP-C-5	A2P1-AFP-C-5-02-RM	TAL A/B/C	477187	1348417
A2P1-AFP-C-5	A2P1-AFP-C-5-02-RM-D	TAL A/B/C	477187	1348417
A2P1-AFP-C-5	A2P1-AFP-C-5-03-RM	TAL A/B/C	477283	1348421
A2P1-AFP-C-5	A2P1-AFP-C-5-04-RM	TAL A/B/C	477298	1348468
A2P1-AFP-C-5	A2P1-AFP-C-5-05-RM	ARCHIVE	477203	1348495
A2P1-AFP-C-5	A2P1-AFP-C-5-06-RM	TAL A/B/C	477252	1348483
A2P1-AFP-C-5	A2P1-AFP-C-5-07-RM	TAL A/B/C	477252	1348544
A2P1-AFP-C-5	A2P1-AFP-C-5-08-RM	TAL A/B/C	477244	1348594
A2P1-AFP-C-5	A2P1-AFP-C-5-09-RM	TAL A/B/C	477363	1348441
A2P1-AFP-C-5	A2P1-AFP-C-5-10-RM	ARCHIVE	477346	1348510
A2P1-AFP-C-5	A2P1-AFP-C-5-11-RM	TAL A/B/C	477436	1348488
A2P1-AFP-C-5	A2P1-AFP-C-5-12-RM	TAL A/B/C	477398	1348568
A2P1-AFP-C-5	A2P1-AFP-C-5-13-RM	TAL A/B/C	477310	1348564
A2P1-AFP-C-5	A2P1-AFP-C-5-14-RM	TAL A/B/C	477293	1348648
A2P1-AFP-C-5	A2P1-AFP-C-5-15-RM	TAL A/B/C	477353	1348593
A2P1-AFP-C-5	A2P1-AFP-C-5-16-RM	ARCHIVE	477346	1348651
A2P1-AFP-C-6	A2P1-AFP-C-6-01-RM	TAL A/B	477229	1348314
A2P1-AFP-C-6	A2P1-AFP-C-6-02-RM	ARCHIVE	477243	1348351
A2P1-AFP-C-6	A2P1-AFP-C-6-03-RM	TAL A/B	477268	1348289
A2P1-AFP-C-6	A2P1-AFP-C-6-04-RM	TAL A/B	477287	1348257
A2P1-AFP-C-6	A2P1-AFP-C-6-05-RM	TAL A/B	477370	1348300
A2P1-AFP-C-6	A2P1-AFP-C-6-05-RM-D	TAL A/B	477370	1348300
A2P1-AFP-C-6	A2P1-AFP-C-6-06-RM	TAL A/B	477318	1348305
A2P1-AFP-C-6	A2P1-AFP-C-6-07-RM	ARCHIVE	477330	1348346
A2P1-AFP-C-6	A2P1-AFP-C-6-08-RM	TAL A/B	477291	1348373
A2P1-AFP-C-6	A2P1-AFP-C-6-09-RM	TAL A/B	477400	1348318
A2P1-AFP-C-6	A2P1-AFP-C-6-10-RM	ARCHIVE	477388	1348352

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MSN

APPENDIX B
A2PI AFP AREA CERTIFICATION SAMPLES

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CERTIFICATION UNIT	SAMPLE ID	ANALYSIS	NORTHING	EASTING
A2P1-AFP-C-6	A2P1-AFP-C-6-11-RM	TAL A/B	477357	1348376
A2P1-AFP-C-6	A2P1-AFP-C-6-12-RM	TAL A/B	477366	1348411
A2P1-AFP-C-6	A2P1-AFP-C-6-13-RM	TAL A/B	477439	1348366
A2P1-AFP-C-6	A2P1-AFP-C-6-14-RM	TAL A/B	477437	1348396
A2P1-AFP-C-6	A2P1-AFP-C-6-15-RM	ARCHIVE	477411	1348413
A2P1-AFP-C-6	A2P1-AFP-C-6-16-RM	TAL A/B	477442	1348475

VARIANCE / FIELD CHANGE NOTICE	V/FCN 20402PSP3-3
WBS NO.: PROJECT/DOCUMENT/ECDC #20402-PSP-0003 Rev 1	Page 1 of 1
PROJECT TITLE: PSP for Certification Sampling for Area 2, Phase I Active Flyash Pile Footprint and Adjacent Area East of the South Construction Road	Date: 1/04/01

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1) The purpose of this Variance/Field Change Notice (V/FCN) is to document the collection of the three archive samples in CU 3, A2PI-AFP-3-C-4, -5, and -9. The samples will not be submitted for analysis unless needed. If there is a need to submit the samples for analysis it will be documented on a V/FCN.

Justification

Any collection of archive samples will be documented on a V/FCN per Section 2.2 of the PSP. These samples are located in a low area within the AFP and are being collected to avoid potential problems collecting these samples in the future, i.e. sample underwater.

ORIGINAL

REQUESTED BY: Deanna Diallo DATE: 1/04/01

X IF REQD	VARIANCE/FCN APPROVAL	DATE	X IF REQD	VARIANCE/FCN APPROVAL	DATE
X	QUALITY ASSURANCE Reinhard Tuttle for F. Thompson	1-4-01	X	Area 2 PROJECT MANAGER	1-4-00
	DATA QUALITY MANAGEMENT			Real-time Program Mgr	
X	ANALYTICAL CUSTOMER SUPPORT Denise M Cruz	1/4/01	X	Area 2 Characterization Lead for M. Rolfs	1-4-00
X	Sampling Manager Tom Bullage	1/4/01		WAO	

VARIANCE/FCN APPROVED [X]YES [ ]NO

REVISION REQUIRED: [ ]YES [x]NO

DISTRIBUTION

PROJECT MANAGER:	DOCUMENT CONTROL: Jeannie Rosser	OTHER:
QUALITY ASSURANCE:	OTHER:	OTHER:

APPENDIX C

CERTIFICATION SAMPLE RESULTS

APPENDIX C
CERTIFICATION SAMPLE RESULTS

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-1	A2P1-AFP-C-1-16-RM	Antimony	6.4	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Arsenic	3.84	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Beryllium	0.06	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Cadmium	0.43	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Molybdenum	0.41	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Radium-226	0.864	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Radium-228	0.62	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Silver	0.51	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Thorium-228	0.593	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Thorium-232	0.62	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-16-RM	Uranium, Total	2.923	U	ug/g	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Antimony	2.58	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Arsenic	11.3	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Beryllium	0.09	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Cadmium	0.54	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Molybdenum	0.4	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Radium-226	1.447	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Radium-228	1.161	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Silver	0.49	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Thorium-228	1.125	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Thorium-232	1.161	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-14-RM	Uranium, Total	3.186	J	ug/g	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Antimony	2.04	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Arsenic	8.84	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Cadmium	0.73	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Molybdenum	0.4	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Radium-226	1.357	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Radium-228	1.077	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Silver	0.49	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Thorium-228	1.04	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Thorium-232	1.077	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-13-RM	Uranium, Total	4.336	J	ug/g	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Antimony	3.38	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Arsenic	16.3	-	mg/kg	YES	NO
C-1	A2P1-AFP-C-1-12-RM	Beryllium	1.05	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Cadmium	1.34	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Molybdenum	0.43	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Radium-226	1.643	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Radium-228	1.256	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Silver	0.52	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Thorium-228	1.226	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Thorium-232	1.256	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-12-RM	Uranium, Total	2.623	U	ug/g	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Antimony	4.2	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Arsenic	12.6	-	mg/kg	YES	NO
C-1	A2P1-AFP-C-1-11-RM	Beryllium	0.32	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Cadmium	0.79	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Molybdenum	0.39	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Radium-226	1	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Radium-228	0.705	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Silver	0.48	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Thorium-228	0.662	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Thorium-232	0.705	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-11-RM	Uranium, Total	3.55	-	ug/g	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Antimony	4.53	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Arsenic	3.92	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Beryllium	0.36	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Cadmium	0.81	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Molybdenum	0.42	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Radium-226	1.278	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Radium-228	0.929	-	pCi/g	NO	NO

APPENDIX C
CERTIFICATION SAMPLE RESULTS

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-1	A2P1-AFP-C-1-10-RM	Silver	0.52	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Thorium-228	0.916	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Thorium-232	0.929	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-10-RM	Uranium, Total	4.073	J	ug/g	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Antimony	4.55	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Arsenic	7.47	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Beryllium	0.09	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Cadmium	0.74	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Molybdenum	0.79	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Radium-226	0.895	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Radium-228	0.589	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Silver	0.46	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Thorium-228	0.606	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Thorium-232	0.589	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-08-RM	Uranium, Total	3.483	J	ug/g	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Antimony	4.51	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Arsenic	7.43	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Beryllium	0.19	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Cadmium	0.51	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Molybdenum	0.4	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Radium-226	0.858	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Radium-228	0.614	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Silver	0.49	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Thorium-228	0.61	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Thorium-232	0.614	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-07-RM	Uranium, Total	3.839	-	ug/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Antimony	4.3	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Arsenic	14	-	mg/kg	YES	NO
C-1	A2P1-AFP-C-1-05-RM-D	Beryllium	0.95	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Cadmium	0.9	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Molybdenum	0.41	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Radium-226	1.581	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Radium-228	1.214	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Silver	0.5	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Thorium-228	1.223	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Thorium-232	1.214	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM-D	Uranium, Total	3.635	J	ug/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Antimony	2.35	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Arsenic	12.4	-	mg/kg	YES	NO
C-1	A2P1-AFP-C-1-05-RM	Beryllium	1.2	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Cadmium	1.27	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Molybdenum	0.42	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Radium-226	1.575	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Radium-228	1.183	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Silver	0.52	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Thorium-228	1.148	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Thorium-232	1.183	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-05-RM	Uranium, Total	4.926	J	ug/g	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Antimony	5.42	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Arsenic	6.2	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Beryllium	0.07	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Cadmium	0.48	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Molybdenum	0.6	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Radium-226	1.113	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Radium-228	0.794	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Silver	0.51	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Thorium-228	0.808	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Thorium-232	0.794	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-04-RM	Uranium, Total	3.044	U	ug/g	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Antimony	4.88	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Arsenic	7.57	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Beryllium	0.12	-	mg/kg	NO	NO

APPENDIX C
CERTIFICATION SAMPLE RESULTS

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CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-1	A2P1-AFP-C-1-03-RM	Cadmium	0.58	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Molybdenum	0.75	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Radium-226	1.048	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Radium-228	0.609	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Silver	0.51	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Thorium-228	0.591	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Thorium-232	0.609	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-03-RM	Uranium, Total	3.005	J	ug/g	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Antimony	3.48	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Arsenic	7.28	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Beryllium	0.19	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Cadmium	0.76	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Molybdenum	0.42	-	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Radium-226	0.826	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Radium-228	0.502	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Silver	0.49	U	mg/kg	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Thorium-228	0.489	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Thorium-232	0.502	-	pCi/g	NO	NO
C-1	A2P1-AFP-C-1-01-RM	Uranium, Total	2.933	J	ug/g	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Antimony	4.16	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Arsenic	8.13	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Beryllium	0.08	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Cadmium	0.55	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Molybdenum	1.04	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Radium-226	1.042	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Radium-228	0.62	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Silver	0.44	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Thorium-228	0.614	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Thorium-232	0.62	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-16-RM	Uranium, Total	12.056	-	ug/g	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Antimony	3.38	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Arsenic	9.07	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Cadmium	0.31	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Molybdenum	0.92	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Radium-226	1.068	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Radium-228	0.664	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Silver	0.45	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Thorium-228	0.644	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Thorium-232	0.664	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-15-RM	Uranium, Total	7.944	-	ug/g	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Antimony	3.45	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Arsenic	5.75	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Cadmium	0.32	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Molybdenum	1.04	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Radium-226	1.229	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Radium-228	0.638	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Silver	0.48	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Thorium-228	0.62	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Thorium-232	0.638	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-13-RM	Uranium, Total	14.249	-	ug/g	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Antimony	2.6	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Arsenic	8.54	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Beryllium	0.2	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Cadmium	0.66	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Molybdenum	1.01	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Radium-226	0.836	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Radium-228	0.672	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Silver	0.5	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Thorium-228	0.659	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-12-RM	Thorium-232	0.672	-	pCi/g	NO	NO

APPENDIX C
CERTIFICATION SAMPLE RESULTS

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-2	A2P1-AFP-C-2-12-RM	Uranium, Total	6.685	-	ug/g	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Antimony	1.66	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Arsenic	8.46	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Beryllium	0.38	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Cadmium	0.99	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Molybdenum	1.12	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Radium-226	1.249	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Radium-228	0.957	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Silver	0.51	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Thorium-228	0.945	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Thorium-232	0.957	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-11-RM	Uranium, Total	3.328	J	ug/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Antimony	3.36	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Arsenic	3.81	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Beryllium	0.15	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Cadmium	0.53	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Molybdenum	0.68	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Radium-226	0.704	J	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Radium-228	0.494	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Silver	0.5	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Thorium-228	0.484	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Thorium-232	0.494	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM-D	Uranium, Total	5.503	J	ug/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Antimony	4.81	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Arsenic	4.8	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Beryllium	0.1	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Cadmium	0.42	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Molybdenum	1.51	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Radium-226	0.829	J	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Radium-228	0.468	J	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Silver	0.52	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Thorium-228	0.464	J	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Thorium-232	0.468	J	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-10-RM	Uranium, Total	9.176	J	ug/g	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Antimony	4.61	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Arsenic	11.5	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Beryllium	0.22	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Cadmium	0.92	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Molybdenum	1.24	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Radium-226	1.207	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Radium-228	0.893	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Silver	0.56	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Thorium-228	0.9	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Thorium-232	0.893	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-08-RM	Uranium, Total	8.307	-	ug/g	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Antimony	1.64	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Arsenic	6.8	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Beryllium	0.04	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Cadmium	0.58	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Molybdenum	1.43	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Radium-226	1.186	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Radium-228	1.021	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Silver	0.56	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Thorium-228	0.954	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Thorium-232	1.021	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-07-RM	Uranium, Total	5.265	-	ug/g	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Antimony	4.65	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Arsenic	5.82	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Beryllium	0.04	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Cadmium	0.41	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Molybdenum	1.68	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Radium-226	5.426	J	pCi/g	YES	NO

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-2	A2P1-AFP-C-2-06-RM	Radium-228	1.2	J	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Silver	0.57	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Thorium-228	1.176	J	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Thorium-232	1.2	J	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-06-RM	Uranium, Total	34.901	J	ug/g	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Antimony	4.03	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Arsenic	4.83	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Beryllium	0.37	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Cadmium	0.81	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Molybdenum	2.01	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Radium-226	1.273	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Radium-228	0.904	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Silver	0.56	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Thorium-228	0.896	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Thorium-232	0.904	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-04-RM	Uranium, Total	15.818	-	ug/g	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Antimony	5.18	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Arsenic	9.67	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Beryllium	0.19	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Cadmium	0.45	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Molybdenum	2.2	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Radium-226	1.001	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Radium-228	0.644	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Silver	0.53	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Thorium-228	0.664	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Thorium-232	0.644	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-02-RM	Uranium, Total	13.475	-	ug/g	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Antimony	3.66	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Arsenic	12.1	-	mg/kg	YES	NO
C-2	A2P1-AFP-C-2-01-RM	Beryllium	0.51	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Cadmium	1.14	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Molybdenum	2.04	-	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Radium-226	1.468	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Radium-228	1.164	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Silver	0.53	U	mg/kg	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Thorium-228	1.157	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Thorium-232	1.164	-	pCi/g	NO	NO
C-2	A2P1-AFP-C-2-01-RM	Uranium, Total	4.699	-	ug/g	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Antimony	2.51	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Arsenic	16.6	-	mg/kg	YES	NO
C-3	A2P1-AFP-C-3-16-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Cadmium	1.15	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Molybdenum	1.63	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Radium-226	1.597	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Radium-228	1.237	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Silver	0.49	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Thorium-228	1.2	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Thorium-232	1.237	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-16-RM	Uranium, Total	4.2	J	ug/g	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Antimony	5.21	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Arsenic	10.2	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Beryllium	0.1	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Cadmium	0.89	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Molybdenum	0.82	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Radium-226	1.322	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Radium-228	1.071	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Silver	0.52	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Thorium-228	1.059	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Thorium-232	1.071	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-15-RM	Uranium, Total	3.517	J	ug/g	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Antimony	4.71	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Arsenic	3.79	-	mg/kg	NO	NO

APPENDIX C
CERTIFICATION SAMPLE RESULTS

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-3	A2P1-AFP-C-3-14-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Cadmium	0.68	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Molybdenum	0.52	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Radium-226	0.76	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Radium-228	0.556	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Silver	0.47	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Thorium-228	0.538	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Thorium-232	0.556	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-14-RM	Uranium, Total	2.529	U	ug/g	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Antimony	3.79	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Arsenic	6.9	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Cadmium	0.66	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Molybdenum	0.47	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Radium-226	1.12	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Radium-228	0.841	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Silver	0.49	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Thorium-228	0.827	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Thorium-232	0.841	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-12-RM	Uranium, Total	3.374	U	ug/g	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Antimony	3.16	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Arsenic	7.03	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Cadmium	0.72	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Molybdenum	0.39	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Radium-226	1.03	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Radium-228	0.858	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Silver	0.47	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Thorium-228	0.847	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Thorium-232	0.858	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-11-RM	Uranium, Total	2.779	J	ug/g	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Antimony	3.45	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Arsenic	3.88	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Cadmium	0.18	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Molybdenum	0.37	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Radium-226	0.832	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Radium-228	0.483	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Silver	0.45	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Thorium-228	0.469	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Thorium-232	0.483	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-10-RM	Uranium, Total	1.896	U	ug/g	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Antimony	5.72	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Arsenic	4.53	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Beryllium	0.04	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Cadmium	0.6	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Molybdenum	1.15	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Radium-226	1.052	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Radium-228	0.885	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Silver	0.5	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Thorium-228	0.852	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Thorium-232	0.885	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-08-RM	Uranium, Total	2.479	J	ug/g	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Antimony	3.72	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Arsenic	4.54	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Beryllium	0.04	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Cadmium	0.79	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Molybdenum	0.6	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Radium-226	1.092	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Radium-228	0.894	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Silver	0.51	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Thorium-228	0.87	-	pCi/g	NO	NO

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-3	A2P1-AFP-C-3-07-RM	Thorium-232	0.894	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-07-RM	Uranium, Total	3.284	J	ug/g	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Antimony	3.98	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Arsenic	10.4	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Beryllium	0.04	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Cadmium	0.72	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Molybdenum	0.46	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Radium-226	1.236	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Radium-228	1.006	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Silver	0.57	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Thorium-228	0.984	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Thorium-232	1.006	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-06-RM	Uranium, Total	2.688	J	ug/g	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Antimony	2.7	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Arsenic	7.51	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Beryllium	0.42	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Cadmium	0.84	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Molybdenum	0.43	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Radium-226	1.172	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Radium-228	0.975	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Silver	0.53	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Thorium-228	0.968	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Thorium-232	0.975	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-03-RM	Uranium, Total	4.719	-	ug/g	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Antimony	5.34	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Arsenic	5.98	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Cadmium	0.37	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Molybdenum	1.46	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Radium-226	0.724	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Radium-228	0.551	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Silver	0.47	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Thorium-228	0.555	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Thorium-232	0.551	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-02-RM	Uranium, Total	2.762	J	ug/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Antimony	5.01	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Arsenic	8.62	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Beryllium	0.03	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Cadmium	0.64	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Molybdenum	2.64	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Radium-226	1.04	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Radium-228	0.719	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Silver	0.46	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Thorium-228	0.705	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Thorium-232	0.719	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM-D	Uranium, Total	2.735	U	ug/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Antimony	3.49	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Arsenic	12.5	-	mg/kg	YES	NO
C-3	A2P1-AFP-C-3-01-RM	Beryllium	0.08	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Cadmium	0.78	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Molybdenum	0.92	-	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Radium-226	1.08	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Radium-228	0.743	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Silver	0.5	U	mg/kg	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Thorium-228	0.727	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Thorium-232	0.743	-	pCi/g	NO	NO
C-3	A2P1-AFP-C-3-01-RM	Uranium, Total	4.216	J	ug/g	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Antimony	3.6	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Arsenic	9.42	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Beryllium	0.48	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Cadmium	0.94	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Molybdenum	0.7	J	mg/kg	NO	NO

APPENDIX C
CERTIFICATION SAMPLE RESULTS

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-4	A2P1-AFP-C-4-15-RM	Radium-226	1.516	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Radium-228	1.185	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Silver	0.52	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Thorium-228	1.169	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Thorium-232	1.185	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-15-RM	Uranium, Total	3.019	U	ug/g	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Antimony	5.23	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Arsenic	3.68	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Cadmium	0.18	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Molybdenum	0.4	UJ	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Radium-226	0.888	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Radium-228	0.606	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Silver	0.48	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Thorium-228	0.581	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Thorium-232	0.606	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-14-RM	Uranium, Total	2.468	U	ug/g	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Antimony	2.46	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Arsenic	10.6	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Beryllium	0.53	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Cadmium	0.74	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Molybdenum	0.39	UJ	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Radium-226	1.336	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Radium-228	0.937	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Silver	0.47	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Thorium-228	0.943	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Thorium-232	0.937	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-13-RM	Uranium, Total	3.737	J	ug/g	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Antimony	3.68	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Arsenic	5.28	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Beryllium	0.19	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Cadmium	0.67	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Molybdenum	0.41	UJ	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Radium-226	1.117	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Radium-228	0.877	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Silver	0.5	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Thorium-228	0.833	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Thorium-232	0.877	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-11-RM	Uranium, Total	2.834	J	ug/g	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Antimony	1.4	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Arsenic	8.84	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Beryllium	0.11	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Cadmium	0.71	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Molybdenum	0.39	UJ	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Radium-226	1.355	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Radium-228	1.049	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Silver	0.48	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Thorium-228	1.024	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Thorium-232	1.049	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-10-RM	Uranium, Total	2.685	U	ug/g	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Antimony	4.35	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Arsenic	4.85	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Beryllium	0.08	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Cadmium	0.72	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Molybdenum	0.45	J	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Radium-226	1.179	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Radium-228	0.931	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Silver	0.5	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Thorium-228	0.925	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Thorium-232	0.931	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-09-RM	Uranium, Total	2.72	U	ug/g	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Antimony	6.02	U	mg/kg	NO	NO

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-4	A2P1-AFP-C-4-08-RM	Arsenic	6.79	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Beryllium	0.09	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Cadmium	0.52	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Molybdenum	0.41	UJ	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Radium-226	1.039	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Radium-228	0.678	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Silver	0.5	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Thorium-228	0.667	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Thorium-232	0.678	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-08-RM	Uranium, Total	1.918	U	ug/g	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Antimony	4.03	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Arsenic	5.72	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Beryllium	0.16	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Cadmium	0.41	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Molybdenum	0.4	UJ	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Radium-226	1.269	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Radium-228	0.749	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Silver	0.49	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Thorium-228	0.699	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Thorium-232	0.749	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-06-RM	Uranium, Total	3.516	J	ug/g	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Antimony	3.02	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Arsenic	9.21	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Beryllium	0.08	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Cadmium	0.57	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Molybdenum	0.42	UJ	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Radium-226	1.177	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Radium-228	0.817	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Silver	0.51	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Thorium-228	0.799	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Thorium-232	0.817	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-05-RM	Uranium, Total	3.898	J	ug/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Antimony	4.27	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Arsenic	5.74	J	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Beryllium	0.04	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Cadmium	0.49	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Molybdenum	0.38	UJ	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Radium-226	1.202	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Radium-228	0.919	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Silver	0.47	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Thorium-228	0.93	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Thorium-232	0.919	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM-D	Uranium, Total	4.097	J	ug/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Antimony	4.02	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Arsenic	11.2	J	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Beryllium	0.13	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Cadmium	0.71	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Molybdenum	1.15	J	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Radium-226	1.196	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Radium-228	0.86	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Silver	0.5	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Thorium-228	0.827	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Thorium-232	0.86	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-04-RM	Uranium, Total	3.233	J	ug/g	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Antimony	3.24	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Arsenic	3.47	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Beryllium	0.13	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Cadmium	0.6	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Molybdenum	0.94	J	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Radium-226	0.838	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Radium-228	0.49	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Silver	0.46	U	mg/kg	NO	NO

APPENDIX C
CERTIFICATION SAMPLE RESULTS

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-4	A2P1-AFP-C-4-03-RM	Thorium-228	0.474	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Thorium-232	0.49	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-03-RM	Uranium, Total	2.57	J	ug/g	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Antimony	2.85	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Arsenic	5.18	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Beryllium	0.17	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Cadmium	0.87	-	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Molybdenum	0.39	UJ	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Radium-226	0.867	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Radium-228	0.62	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Silver	0.47	U	mg/kg	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Thorium-228	0.623	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Thorium-232	0.62	-	pCi/g	NO	NO
C-4	A2P1-AFP-C-4-01-RM	Uranium, Total	2.766	J	ug/g	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Antimony	3.15	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Arsenic	7.31	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Cadmium	0.15	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Molybdenum	0.71	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Neptunium-237	0.075	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Radium-226	0.748	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Radium-228	0.557	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Silver	0.47	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Thorium-228	0.531	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Thorium-232	0.557	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-15-RM	Uranium, Total	4.053	J	ug/g	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Antimony	3.08	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Arsenic	10.4	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Beryllium	0.16	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Cadmium	0.72	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Molybdenum	0.57	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Neptunium-237	0.087	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Radium-226	0.935	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Radium-228	0.682	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Silver	0.52	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Thorium-228	0.68	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Thorium-232	0.682	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-14-RM	Uranium, Total	2.845	J	ug/g	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Antimony	2.51	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Arsenic	7.24	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Beryllium	0.04	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Cadmium	0.61	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Molybdenum	0.61	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Neptunium-237	0.097	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Radium-226	0.93	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Radium-228	0.718	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Silver	0.52	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Thorium-228	0.687	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Thorium-232	0.718	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-13-RM	Uranium, Total	8.785	UJ	ug/g	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Antimony	3.21	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Arsenic	3.71	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Beryllium	0.06	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Cadmium	0.6	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Molybdenum	0.66	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Neptunium-237	0.08	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Radium-226	0.675	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Radium-228	0.654	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Silver	0.49	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Thorium-228	0.635	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Thorium-232	0.654	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-12-RM	Uranium, Total	2.44	UJ	ug/g	NO	NO

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-5	A2P1-AFP-C-5-11-RM	Antimony	1.54	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Arsenic	3.75	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Beryllium	0.05	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Cadmium	0.38	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Molybdenum	0.4	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Neptunium-237	0.083	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Radium-226	0.821	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Radium-228	0.62	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Silver	0.49	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Thorium-228	0.578	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Thorium-232	0.62	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-11-RM	Uranium, Total	2.135	UJ	ug/g	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Antimony	2.41	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Arsenic	5.23	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Beryllium	0.05	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Cadmium	0.65	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Molybdenum	0.62	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Neptunium-237	0.074	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Radium-226	0.729	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Radium-228	0.571	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Silver	0.47	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Thorium-228	0.553	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Thorium-232	0.571	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-09-RM	Uranium, Total	2.302	UJ	ug/g	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Antimony	3.52	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Arsenic	3.87	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Cadmium	0.46	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Molybdenum	0.42	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Neptunium-237	0.083	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Radium-226	0.878	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Radium-228	0.742	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Silver	0.51	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Thorium-228	0.723	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Thorium-232	0.742	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-08-RM	Uranium, Total	2.386	UJ	ug/g	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Antimony	2.89	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Arsenic	3.7	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Cadmium	0.38	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Molybdenum	0.8	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Neptunium-237	0.07	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Radium-226	0.574	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Radium-228	0.428	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Silver	0.49	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Thorium-228	0.421	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Thorium-232	0.428	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-07-RM	Uranium, Total	2.316	J	ug/g	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Antimony	4.2	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Arsenic	8.43	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Beryllium	0.1	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Cadmium	0.62	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Molybdenum	1.7	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Neptunium-237	0.086	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Radium-226	0.848	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Radium-228	0.654	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Silver	0.47	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Thorium-228	0.659	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Thorium-232	0.654	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-06-RM	Uranium, Total	2.494	UJ	ug/g	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Antimony	3.37	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Arsenic	3.67	U	mg/kg	NO	NO

APPENDIX C
CERTIFICATION SAMPLE RESULTS

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-5	A2P1-AFP-C-5-04-RM	Beryllium	0.06	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Cadmium	0.52	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Molybdenum	0.47	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Neptunium-237	0.084	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Radium-226	0.776	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Radium-228	0.662	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Silver	0.48	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Thorium-228	0.672	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Thorium-232	0.662	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-04-RM	Uranium, Total	2.481	UJ	ug/g	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Antimony	3.48	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Arsenic	3.62	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Cadmium	0.47	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Molybdenum	1.47	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Neptunium-237	0.078	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Radium-226	0.764	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Radium-228	0.598	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Silver	0.48	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Thorium-228	0.59	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Thorium-232	0.598	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-03-RM	Uranium, Total	2.878	UJ	ug/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Antimony	2.58	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Arsenic	3.7	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Beryllium	0.08	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Cadmium	0.63	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Molybdenum	1.94	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Neptunium-237	0.091	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Radium-226	1.341	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Radium-228	0.976	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Silver	0.49	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Thorium-228	0.982	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Thorium-232	0.976	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM-D	Uranium, Total	2.672	UJ	ug/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Antimony	1.4	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Arsenic	3.61	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Cadmium	0.98	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Molybdenum	0.62	-	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Neptunium-237	0.089	U	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Radium-226	1.231	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Radium-228	0.979	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Silver	0.48	U	mg/kg	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Thorium-228	0.973	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Thorium-232	0.979	-	pCi/g	NO	NO
C-5	A2P1-AFP-C-5-02-RM	Uranium, Total	8.705	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Antimony	5.69	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Arsenic	11.8	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Beryllium	0.15	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Cadmium	0.73	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Molybdenum	1.07	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Radium-226	1.11	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Radium-228	0.806	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Silver	0.52	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Thorium-228	0.824	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Thorium-232	0.806	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-16-RM	Uranium, Total	8.002	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Antimony	4.26	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Arsenic	4.59	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Cadmium	0.44	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Molybdenum	0.89	-	mg/kg	NO	NO

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-6	A2P1-AFP-C-6-14-RM	Radium-226	0.93	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Radium-228	0.529	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Silver	0.49	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Thorium-228	0.518	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Thorium-232	0.529	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-14-RM	Uranium, Total	2.348	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Antimony	4.34	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Arsenic	3.33	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Cadmium	0.42	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Molybdenum	0.69	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Radium-226	0.687	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Radium-228	0.338	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Silver	0.44	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Thorium-228	0.332	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Thorium-232	0.338	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-13-RM	Uranium, Total	2.017	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Antimony	4.67	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Arsenic	7.89	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Beryllium	0.28	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Cadmium	0.39	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Molybdenum	0.5	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Radium-226	0.919	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Radium-228	0.662	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Silver	0.48	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Thorium-228	0.675	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Thorium-232	0.662	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-12-RM	Uranium, Total	7.466	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Antimony	4.08	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Arsenic	4.18	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Beryllium	0.06	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Cadmium	0.42	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Molybdenum	0.93	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Radium-226	0.976	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Radium-228	0.706	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Silver	0.46	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Thorium-228	0.7	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Thorium-232	0.706	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-11-RM	Uranium, Total	9.184	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Antimony	4.69	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Arsenic	3.7	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Beryllium	0.3	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Cadmium	0.44	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Molybdenum	1.28	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Radium-226	0.887	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Radium-228	0.65	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Silver	0.49	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Thorium-228	0.671	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Thorium-232	0.65	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-09-RM	Uranium, Total	12.243	-	ug/g	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Antimony	2.72	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Arsenic	3.52	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Beryllium	0.06	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Cadmium	0.44	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Molybdenum	0.99	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Radium-226	0.936	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Radium-228	0.674	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Silver	0.46	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Thorium-228	0.686	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Thorium-232	0.674	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-08-RM	Uranium, Total	2.49	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Antimony	4.71	-	mg/kg	NO	NO

APPENDIX C
CERTIFICATION SAMPLE RESULTS

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-6	A2P1-AFP-C-6-06-RM	Arsenic	4.8	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Beryllium	0.17	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Cadmium	0.34	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Molybdenum	0.89	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Radium-226	0.944	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Radium-228	0.692	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Silver	0.48	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Thorium-228	0.674	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Thorium-232	0.692	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-06-RM	Uranium, Total	2.155	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Antimony	4.73	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Arsenic	3.42	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Beryllium	0.07	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Cadmium	0.35	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Molybdenum	1.16	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Radium-226	0.85	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Radium-228	0.563	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Silver	0.45	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Thorium-228	0.578	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Thorium-232	0.563	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM-D	Uranium, Total	3.397	J	ug/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Antimony	4.27	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Arsenic	6.98	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Beryllium	0.2	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Cadmium	0.51	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Molybdenum	1.44	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Radium-226	0.909	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Radium-228	0.657	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Silver	0.47	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Thorium-228	0.662	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Thorium-232	0.657	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-05-RM	Uranium, Total	3.053	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Antimony	1.51	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Arsenic	4.35	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Beryllium	0.36	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Cadmium	0.92	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Molybdenum	0.96	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Radium-226	1.294	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Radium-228	0.956	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Silver	0.48	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Thorium-228	0.96	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Thorium-232	0.956	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-04-RM	Uranium, Total	8.355	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Antimony	2.82	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Arsenic	3.79	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Beryllium	0.12	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Cadmium	0.3	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Molybdenum	1.19	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Radium-226	0.829	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Radium-228	0.462	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Silver	0.5	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Thorium-228	0.457	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Thorium-232	0.462	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-03-RM	Uranium, Total	7.072	UJ	ug/g	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Antimony	4.45	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Arsenic	9.99	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Beryllium	0.03	U	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Cadmium	0.57	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Molybdenum	0.98	-	mg/kg	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Radium-226	0.718	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Radium-228	0.445	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Silver	0.45	U	mg/kg	NO	NO

APPENDIX C
CERTIFICATION SAMPLE RESULTS

CU	Sample ID	Parameter	Result	Qualifier	Units	Above FRL	Above BTV
C-6	A2P1-AFP-C-6-01-RM	Thorium-228	0.438	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Thorium-232	0.445	-	pCi/g	NO	NO
C-6	A2P1-AFP-C-6-01-RM	Uranium, Total	2.106	UJ	ug/g	NO	NO